Aspire T670
AcerPower FE
Service Guide

Service guide files and updates are available on the AIPG/CSD web; for more information, please refer to http://csd.acer.com.tw

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Revision History

Please refer to the table below for the updates made on Aspire T670/AcerPower FE service guide.

Date	Chapter	Updates

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Conventions

The following conventions are used in this manual:

SCREEN MESSAGES	Denotes actual messages that appear on screen.
NOTE	Gives bits and pieces of additional information related to the current topic.
WARNING	Alerts you to any damage that might result from doing or not doing specific actions.
CAUTION	Gives precautionary measures to avoid possible hardware or software problems.
IMPORTANT	Reminds you to do specific actions relevant to the accomplishment of procedures.

Preface

Before using this information and the product it supports, please read the following general information.

1. This Service Guide provides you with all technical information relating to the BASIC CONFIGURATION decided for Acer's "global" product offering. To better fit local market requirements and enhance product competitiveness, your regional office MAY have decided to extend the functionality of a machine (e.g. add-on card, modem, or extra memory capability). These LOCALIZED FEATURES will NOT be covered in this generic service guide. In such cases, please contact your regional offices or the responsible personnel/channel to provide you with further technical details.
2. Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. If, for whatever reason, a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

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System Specifications

Overview

All the new Socket-T motherboards come with a socket protector that has to be removed before you fit the CPU. This is to prevent damage to the pins inside the CPU socket before the chip is inserted. The new CPU socket is known as Socket-T and the new processors will be of LGA775 type. LGA stands for Land Grid Array and means that there are no pins on the bottom of the CPU, although there are still contact surfaces - no less 775 of them. The CPU interface has been moved to the mainboard socket and this is a way for Intel to get fewer returns in terms of damaged CPUs due to bent or broken pins.

These two models (Aspire T670 & AcerPower FE) choose Intel Pentium 4 LGA 775 (socket _T) processor. Intel 915GL+ ICH6 (Prescott) chipset architecture. This combination can run at 800MHz Front Side Bus and provides On-Board VGA and discrete VGA support, which provides better performance than other processors. This model with one PCI-Express x16 slot, three PCI slots (support PCI 2.2 spec.), 2 Dual Channel DDR 1 memory slots (support up to 2GB), one P-ATA devices (HDD/ODD), two S-ATA devices (HDDs), on board 10/100 LAN, and on board audio function.

Aspire T670 will be the product name for consumer market. AcerPower FE will be the product name for commercial market. Please refer below table for more details address toward each chipset that be used in this project : (It's only for reference as guideline)

Chipset	General Features
Intel 915GL (North Bridge)	❑ One Intel® Pentium® 4 processor or Intel® Celeron® D processor including 775-Land package. ❑ Supports Pentium 4 processor FSB interrupt delivery ❑ Support 533 MT/s(133 MHz) FSB ❑ 32-bit host bus addressing for access to 4GB of memory space ❑ 256MB, 512MB and 1GB DDR/DDR2 technologies ❑ PCI Express Graphics Interface ❑ 400 MHz Integrated 24-bit RAMDAC ❑ 37.5 mm x 37.5 mm, 1210 balls, variable ball pitch

Chipset	General Features
Intel® ICH6	❑ The MCH has on 16-lane (x16 Port) PCI Express port, provided for the Graphics Attach (i.e., PCI Express). PCI Express supports a base frequency of 2.5 GHz only. ❑ PCI Express Base Specification, Revision 1.0a-compliant ❑ Supports 4-x1 PCI Express ports ❑ PCI slots (supports up to 7 Req/Gnt pairs) ❑ ACPI Power Management Logic Support ❑ Enhanced DMA controller, interrupt controller, and timer functions ❑ Integrated LAN controller ❑ Supports Audio Codec '97, Revision 2.3 Specification (a.k.a., AC '97 Component Specification, Revision 2.3) which provides a link for Audio and Telephony codecs (up to 7 channels) ❑ Supports Intel® High Definition Audio Specification
REALTEK ALC655 Controller	❑ Meets performance requirements for audio on PC99/ 2001 systems ❑ Meets Microsoft WHQL/WLP 2.0 audio requirements ❑ 16-bit Stereo full-duplex CODEC with 48KHz sampling rate ❑ External Amplifier Power Down(EAPD) capability ❑ Support 32K/44.1K/48KHz of S/PDIF input
REALTEK RTL8100C Ethernet Controller	❑ Integrated Fast Ethernet MAC, Phsical chip, and transceiver in one chip ❑ 10Mbps and 100Mbps operation ❑ Supports Wake-On-LAN and remote wake-up (Magic Packet*, LinkChg, and Microsoft® wake-up frame) ❑ Supports 4 Wake-On-LAN (WOL) signals (active high, active low, positive pulse, and negative pulse) ❑ Supports LED pins for various network activity indications ❑ Supports Full Duplex Flow Control (IEEE 802.3x)
ITE IT8712 Controller	❑ Supports up to 1/240 duty cycle ❑ Provides 320 LCD drive circuits ❑ Provides 2.6 to 5.5V LCD drive voltage ❑ Provides 2.5 to 5.5V operating voltage ❑ Provides 4-bit or 8-bit parallel data input ❑ Supports screen display off function ❑ Supports the automatic generation of chip enable sign ❑ Supports Power standby function

Features

CPU

- Socket Type : Intel Socket T
- Supports Intel Pentium 4 Prescott 775 / FSB 533/800MHz
- Supports Intel Celeron Prescott 775 / FSB 533MHz
- Pentium 4 2.66GHz ~3.8GHz speed
- Celeron D 2.53GHz ~ 3.2GHz
- L2 Cache varies with CPU from 1MB to 2MB

Chipset

- Northbridge: Intel 915GL
- Southbridge: ICH6

Memory

- Socket Type : DDR , 2.5 Voltage
- Socket Quantity : 2
- Capacity support : 128MB ~ 2GB
- Support Memory Speed : 400/333 MHz

Graphic Solution

- Intel Grantsdale-GL on-die graphic solution
- DVMT(Dynamic Video Memory Technology) technology support

Slots

- 1 PCI Express x16 slot
- 3 PCI 2.2 5V slots

FDD

- One 1.44MB 3.5” device
- Allow connection of 2 FDD devices

IDE (PATA / SATA)

- Slot Type : 40pin PATA IDE slot
- **PATA Connector Quantity : 1**
- Transfer rate support PIO mode 0 (3.33MB/s) /1 (5.22MB/s) /2 (8.33MB/s) /3 (11.1MB/s) / 4 (16.7MB/s)
- ATA mode : 33/66/100
- Device Type Support : HDD/CD-ROM/DVD-ROM/Combo/DVD burner
- Connector Type : SATA IDE Connector
- **SATA Connector Quantity : 2**
- Storage Type Support : HDD

Audio

- Controller: Intel ICH6
- Codec : Realtek ALC655
- Connector support Lin in/ Lin out, Microphone In (rear) / Microphone in (front - default), Headphone Out (front- default), Headphone In (rear),
- When earphone is plugged in the front access audio jack, speaker-out will mute automatically.
- 5.1 Channel Audio Support
- Reserved disable function on BIOS side. Default is enabled.

LAN

- Controller : Realtek 8100C
- Should be worked under 10/100 Mbs environment
- Reserved disabled function on both hardware & BIOS side. Default is enabled

USB

- Controller : Intel ICH6
- Connectors Quantity : 8 (4 on rear connector, 4 on-board header)
- 1 for front daughter board
- 1 for Multi-Media card reader (Pin : 2*5)
- USB 2.0/1.1

System LED Definition

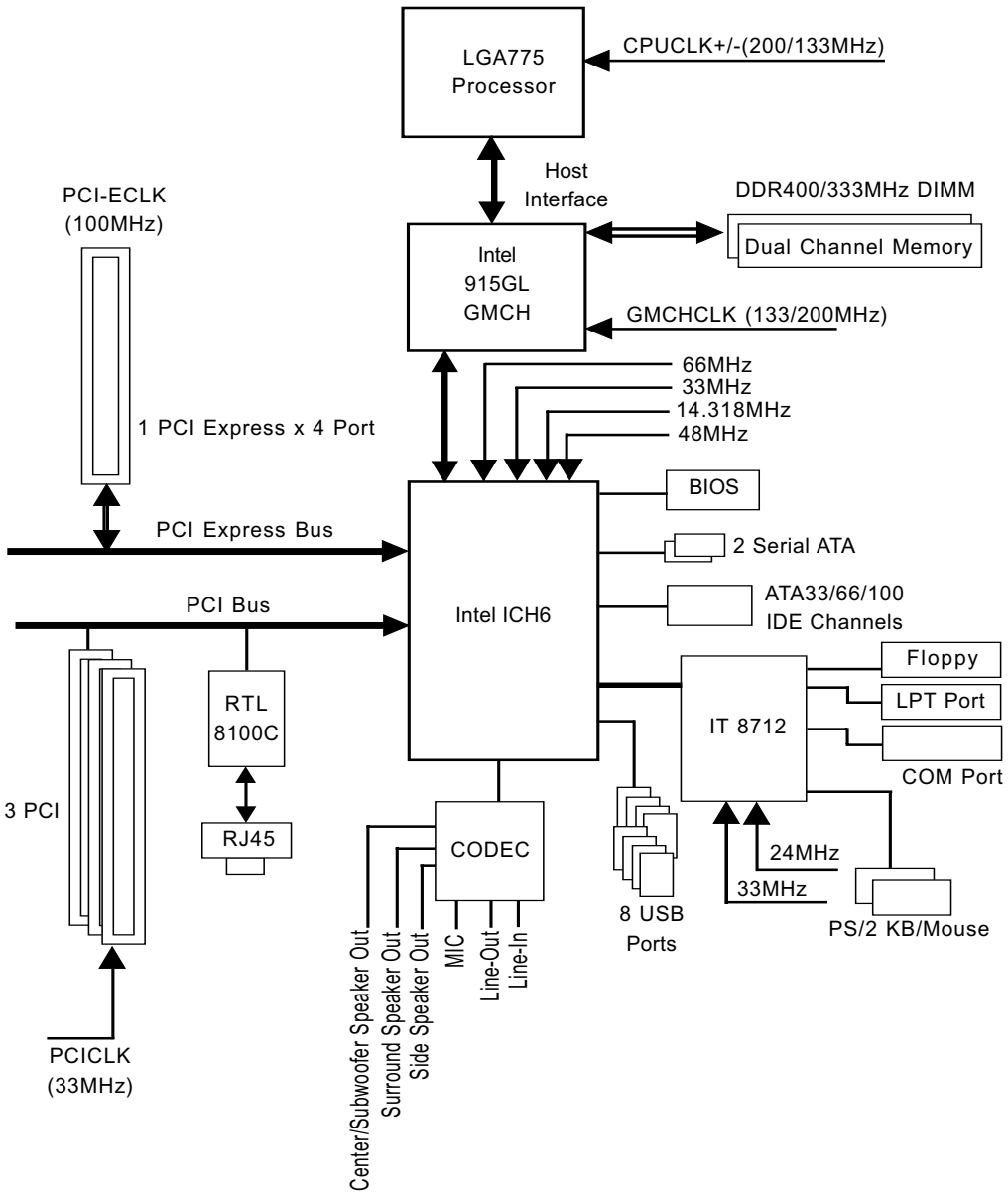
LED Item	Color
Power state LED	
S0	Green Steady
S1/S3	Amber Steady
S4/S5	Off
HDD state LED	
IDE active	Red Blinking
IDE idle	Off
System LED definition (for S43--Aspire series bezel)	
Power State LED	
S0	Green Steady
S1/S3	Amber Steady
S4/S5	Off
HDD state LED	
IDE active	Red Blinking
IDE idle	Off
System LED definition (for P451 -- AcerPower series bezel)	
Power state LED	
S0	Blue Steady
S1/S3	Off
S4/S5	Off
ODD, HDD, LAN	
Active Blue **System LED definition (for P451 AcerPower series bezel)**	
Power State LED	
S0	Blue Steady
S1/S3	Blue Blinking
S4/S5	Off

On-Board Connector

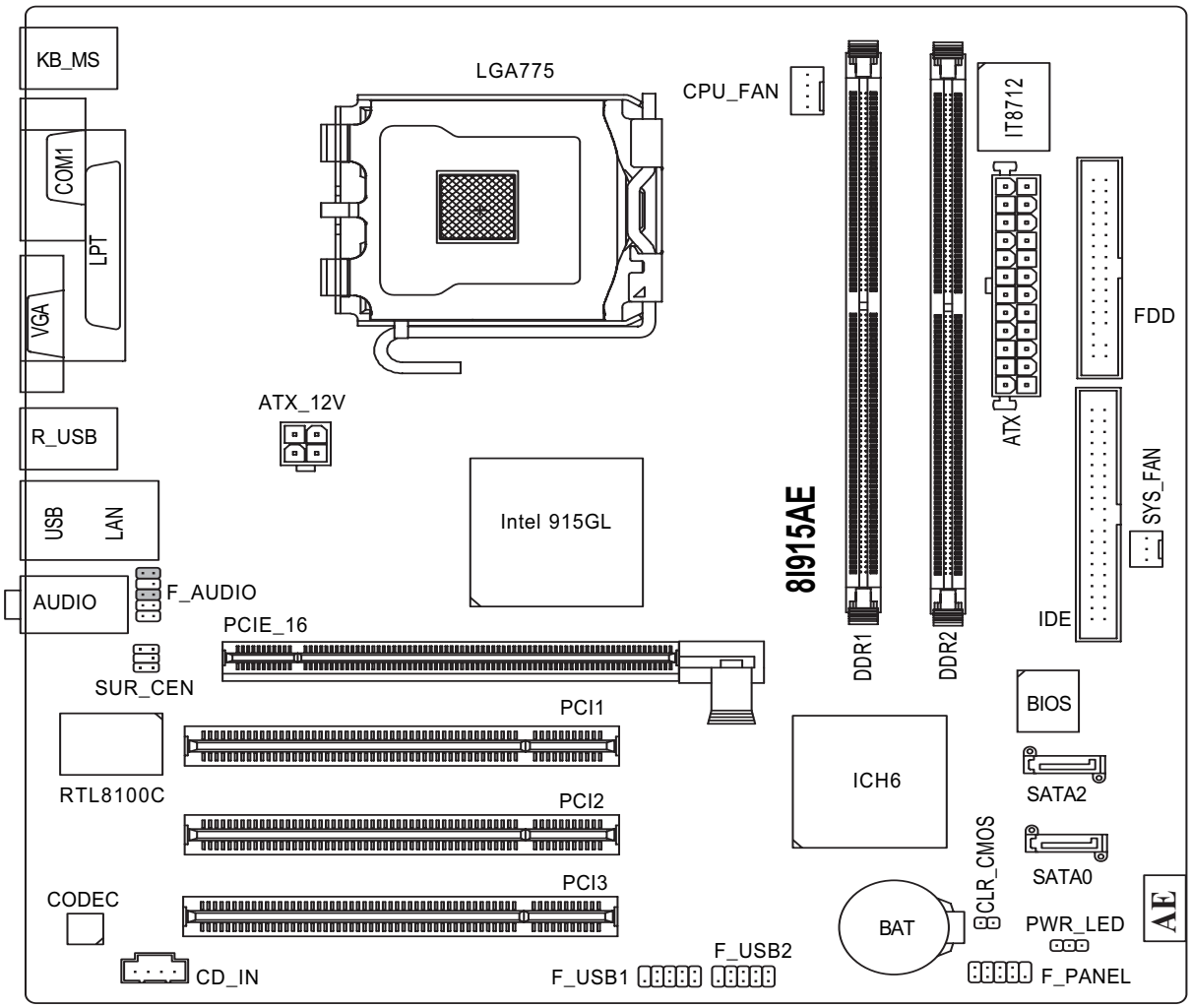
- Rear I/O Connectors
  - 1 PS/2 Keyboard Port, 1 PS/2 Mouse Port
  - 1 Parallel Port, 1 Serial Port
  - 1 VGA Port
  - 1 10/100 LAN Port
  - 4 USB Ports
  - 1 Line-in/Line-out/Mic-in port
- On-Board Connectos
  - 1 CPU Socket
  - 2 Memory Slot
  - 1 PCI Express x16 Slot
  - 3 PCI Slots
  - 1 FDD Slot
  - 1 PATA IDE Slots

- 2 SATA IDE Slots
- 2 2*5 pin USB pin connector, 1 CD-in 4pin connector
- 1 serial port pin connector (2nd serial port)
- 1 CD-In 4pin connector (CD-ROM Audio Input)
- 1 3pin System FAN connector
- 1 24pin/4pin ATX interface PS3/PS2 SPS connector
- 1 2*5pin Intel FPIO specification Power Switch/Power State LED/HDD active LED
- 1 2 pin LAN activity monitor connector
- 2 reserved 2pin GPIO connector
- Color management for on board connector

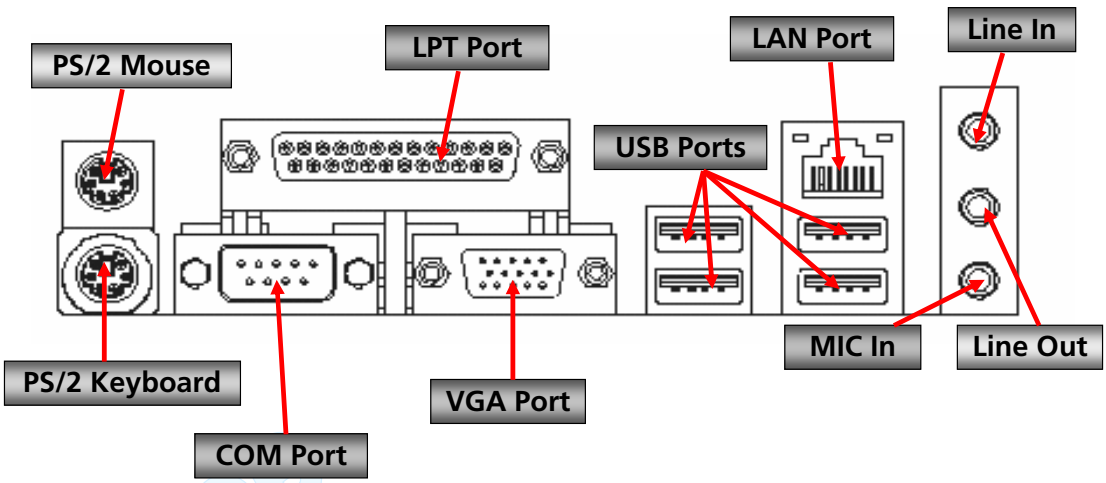
Block Diagram



MainBoard Placement



Rear I/O Port



Item	Description
PS/2 Keyboard and PS/2 Mouse Connector	To install a PS/2 port keyboard and mouse, plug the mouse to the upper port (green) and the keyboard to the ower port (purple).
LPT Port (Parallel Port)	The parallel port allows connection of a printer, scanner and other peripheral devices.
COM (Serial Port)	Connects to serial-based mouse or data processing devices.
VGA Port	Monitor can be connected to VGA port.
USB Ports	Before you connect your device(s) into USB connector(s), please make sure your device(s) such as USB keyboard, mouse, scanner, zip, speaker...etc. have a standard USB interface. Also make sure your OS supports USB controller. If your OS does not support USB controller, please contact OS vendor for possible patch or driver upgrade. For more information please contact your OS or device(s) vendors.
LAN Port	Internet connection with speed of 10/100 Mbps
Surround Speaker/Line In	Devices like CD-ROM, walkman etc. can be connected to Line In jack.
Line Out	Connect the stereo speakers or earphone to this connector.
Center / Subwoofer Speaker Out /MIC In	Microphone can be connected to MIC In jack.

Aspire T670 Front Panel

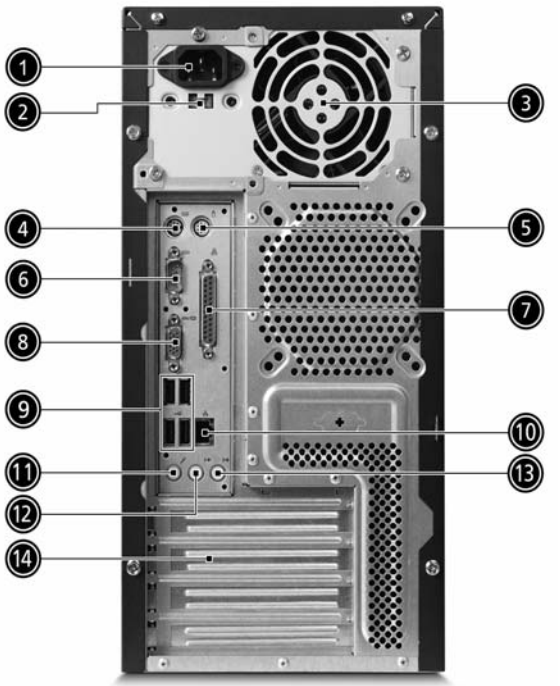
No.	Description	No.	Description
1	Optical drive	2	Floppy drive
3	Power button	4	Speaker or headphone jack
5	Microphone jack	6	USB ports

NOTE: The specifications above are for reference only. The exact configuration of your PC depends on the model purchased.

AcerPower FE Front Panel

No.	Description	No.	Description
1	Optical drive	2	Floppy drive
3	Card reader(Manufacturing Option)	4	Indicators
5	USB ports	6	Microphone-inJack
7	Speaker/HeadphoneJack	8	Power Button

Rear Panel



No.	Description	No.	Description
1	Power cord socket	2	Voltage selector switch
3	Fan aperture	4	PS/2 keyboard connector
5	PS/2 mouse connector	6	Serial port
7	Printer connector	8	Monitor connector
9	USB 2.0 ports	10	RJ-45 Ethernet connector
11	Microphone jack	12	Line-out jack
13	Line-in jack	14	Extension card slots

System Peripherals

The Aspire T670 and AcerPower FE computer consist of the system itself, and system peripherals, like a mouse, keyboard and a set of speakers (optional). This section provides a brief description of the basic system peripherals.

Mouse (PS/2 or USB, manufacturing option)

The included mouse is a standard two-button wheel mouse. Connect the mouse to the PS/2 mouse port or USB port on the back panel of the system.

Keyboard (PS/2 or USB, manufacturing option)

Connect the keyboard to the PS/2 keyboard port or USB port on the back panel of the system.

Speakers

For systems bundled with speakers, before powering on the system, connect the speaker cable to the audio out (external speaker) port on the back panel of the system.

For more detailed information about the speakers, please refer to the included operating instructions.

NOTE: speakers are optional and the appearance might be different depending on the actual product.

Acer eRecovery

Acer eRecovery is a tool to quickly backup and restore the system. Users can create and save a backup of the current system configuration to hard drive, CD, or DVD.

Acer eRecovery consists of the following functions:

1. Create backup
2. Restore from backup
3. Create factory default image CD
4. Re-install bundled software without CD
5. Change Acer eRecovery password

Create backup

Users can create and save backup images to hard drive, CD, or DVD.

1. Boot to Windows XP
2. Press **<Alt>+<F10>** to open the Acer eRecovery utility.
3. Enter the password to proceed. The default password is six zeros.
4. In the Acer eRecovery window, select **Recovery settings** and click **Next**
5. In the Recovery settings window, select **Backup snapshot image** and click **Next**.
6. Select the backup method.
   - ❑ Use **Backup to HDD** to store the backup disc image on drive D:.
   - ❑ **Backup to optical device** to store the backup disc image on CD or DVD (only available on systems that include an optical disc burner).
7. After choosing the backup method, click **Next**.

Follow the instruction on screen to complete the process.

Restore from backup

Users can restore backup previously created (as stated in the **Create backup** section) from hard drive, CD, or DVD.

1. Boot to Windows XP.
2. Press **<Alt>+<F10>** to open the Acer eRecovery utility.
3. Enter the password to proceed. The default password is six zeros.
4. In the Acer eRecovery window, select **Recovery actions** and click **Next**.
5. Select the desired restore action and follow the onscreen instructions to complete the restore process.

Create factory default image CD

When the System CD and Recovery CD are not available, you can create them by using this feature.

1. Boot to Windows XP.
2. Press **<Alt>+<F10>** to open the Acer eRecovery utility.
3. Enter the password to proceed. The default password is six zeros.
4. In the Acer eRecovery window, select **Recovery settings** and click **Next**.
5. In the Recovery settings window, select **Burn image to disc** and click **Next**.
6. In the Burn image to disc window, select **01. Factory default image** and click **Next**.
7. Follow the instructions on screen to complete the process.

Re-install bundled software without CD

Acer eRecovery stores pre-loaded software internally for easy driver and application re-installation.

1. Boot to Windows XP.
2. Press **<Alt>+<F10>** to open the Acer eRecovery utility.
3. Enter the password to proceed. The default password is six zeros.
4. In the Acer eRecovery window, select Recovery actions and click **Next**.
5. In the Recovery settings window, select **Reinstall applications/drivers** and click **Next**.
6. Select the desired driver/application and follow the instructions on screen to re-install.

At first launch, Acer eRecovery prepares all the needed software and may take few seconds to bring up the software content window.

Change Password

Acer eRecovery and Acer disc-to-disc recovery are protected by a password that can be changed by the user. Follow the steps below to change the password in Acer eRecovery.

1. Boot to Windows XP.
2. Press **<Alt>+<F10>** to open the Acer eRecovery utility.
3. Enter the password to proceed. The default password is six zeros.
4. In the Acer eRecovery window, select **Recovery settings** and click **Next**.
5. In the Recovery settings window, select **Password**: **Change Acer eRecovery password** and click **Next**.
6. Follow the instructions on screen to complete the process.

Acer disc-to-disc recovery

Restore without a Recovery CD

This recovery process helps you restore the C: drive with the original software content that is installed when you purchase your notebook. Follow the steps below to rebuild your C: drive. (Your C: drive will be reformatted and all data will be erased.) It is important to back up all data files before you use this option.

1. Restart the system.
2. While the Acer logo is showing, press <Alt>+<F10> at the same time to enter the recovery process.
3. The message "The system has password protection. Please enter 000000:" is displayed.
4. Enter six zeros and continue.
5. The Acer Recovery main page appears.
6. Use the arrow keys to scroll through the items (operating system versions) and press <Enter> to select.

Multilingual operating system installation

Follow the instructions to choose the operating system and language you prefer when you first power-on the system.

1. Turn on the system.
2. Acer's multilingual operating system selection menu will pop-up automatically.
3. Use the arrow keys to scroll to the language version you want. Press <Enter> to confirm your selection.
4. The operating system and language you choose now will be the only option for future recovery operations.
5. The system will install the operating system and language you choose.

System Board Major Chip

Item	Specification
System Core Logic	Northbridge : Intel 915GL Southbridge : Intel ICH6
Super I/O Controller	IT8712
LAN Controller	Realtek 8100C
Memory Controller	Intel 915GL
E-IDE Controller	Intel ICH6
SATA Controller	Intel ICH6
RJ45 Controller	RTL 8100C
Audio Controller	Realtek ALC655, Intel 915GL, 3M
VGA Controller	915GL
PS/2 Keyboard/Mouse Controller	IT8712
USB Controller	Intel ICH6

Processor

Item	Specification
Type	Intel Pentium 4 processor 775 Land Grid Array(LGA)
Slot	Socket-T (LGA 775)
Speed	Depends on CPU, which is local configured
Bus Frequency	533/800 MHz
Voltage	Processor voltage can be detected by any system without setting any jumper

BIOS

Item	Specification
BIOS code programmer	Award
BIOS version	N/A
BIOS ROM size	3MB
BIOS ROM package	32-pin PLCC package
Support protocol	PCIX 1.0,PCI 2.2,APM 1.2,VESA/DPMS (VBE/PM V1.1), SMBIOS 2.3, E-IDE 1.1, ACPI 1.0b,ESCD1.03, PnP 1.0a, Bootable CD-ROM 1.0, USB 1.1~ USB 2.0, UHCI 1.0, ANSI ATA 3.0 ATAPI
Boot from CD-ROM feature	Yes
Support to LS-120 drive	Yes
Support to BIOS boot block feature	Yes
BIOS Password Control	Yes

NOTE: The BIOS can be overwritten/upgraded by using “AFLASH” utility (AFLASH.EXE).

BIOS Hotkey List

Hotkey	Function	Description
DEL	Enter BIOS Setup Utility	Press while the system is booting to enter BIOS Setup Utility.

System Memory

Item	Specification
Memory Slot Number	2 Slots
Supported Memory Size per Slot	128 MB ~ 1GB
Supported Maximum Memory Size	2GB
Supported Memory Speed	400/333 MHz
Supported memory voltage	2.5 V
Support memory module package	184-pin DIMM
Support to parity check feature	Yes
Support to Error Correction Code (ECC) feature	Yes
Memory module combinations	You can install memory modules in any combination as long as they match the above specifications.

Cache Memory

Item	Specification
First-Level Cache Configurations	
Cache function control	Enable/Disable by BIOS Setup
Second-Level Cache Configurations The information below is only applicable to system installed with a Pentium 4 processor	
Tag RAM Location	On Processor
L2 Cache RAM Location	On Processor
L2 Cache RAM type	PBSRAM (Pipelined-burst Synchronous RAM)
L2 Cache RAM size	Depends on CPU, which is local configured
L2 Cache RAM speed	Full of the processor core clock frequency (Advanced Transfer Cache)
L2 Cache function control	Enable/Disable by BIOS Setup
L2 Cache scheme	Fixed in write-back

LAN Interface

Item	Specification
LAN Controller	RTL8100C
LAN Controller Resident Bus	PCI Bus
LAN Port	ONE RJ-45 on board
Function Control	Enable/Disable by BIOS Setup

IDE Interface

Item	Specification
IDE Controller	Intel ICH6
IDE Controller Resident Bus	PCI bus

IDE Interface

Item	Specification
Number 40 pin PATA slot	1
❑ Device Type Support	HDD, CD-ROM, CD-RW, DVD-ROM,Combo,DVD burner
❑ Transfer Rate Support	PIO 0/1/2/3/4
❑ ATA Mode	33/66/100
Number STAT IDE slot	2
❑ Device Type Support	HDD
Supports LS-120	Yes
Supports bootable CD-ROM	Yes
Function Control	Enable/Disable by BIOS setup

Diskette Drive Interface

Item	Specification
Diskette Drive Controller	IT8712
Diskette Drive Controller Resident Bus	LPC Bus
Supported Diskette Drive Formats	1.44MB, 2.88MB format and slim type diskette drive
Function Control	Enable/Disable by BIOS Setup

Serial Port

Item	Specification
Serial port controller	IT8712
Serial port controller resident bus	LPC Bus
Number of serial port	1
Serial port location	COM1
16550 UART support	Yes
Connector type	9-pin D-type female connector

USB Port

Item	Specification
Universal HCI	USB 2.0/1.1
Controller	Intel ICH6
Number of the connectors	8
Location	Rear : 4 On-board header : 4
USB Class	Support legacy keyboard for legacy mode

Wake-up Event Specifications

Device	S1	S3	S4	S5
Power Button	Enabled	Enabled	Enabled	Enabled
PS2 Keyboard	Enabled	Enabled	Enabled	Enabled
USB Keyboard	Disabled	Disabled	Enabled	Disabled

Wake-up Event Specifications

Device	S1	S3	S4	S5
RTC	Enabled	Enabled	Enabled	Enabled
LAN	Enabled	Enabled	Enabled	Enabled

Thermal Design

Item	Description
Thermal Design	❑ Dynamic FAN speed control by hardware monitor ❑ CPU Over-temperature (over 120^{o}C) power off protection

Power On / Wake-up Event

Item	Description
Power On/ Wake-Up Event	❑ Power Button: S1/S3/S4/S5 ❑ PS/2 Keyboard: S1/S3/S4/S5 ❑ RTC: S1/S5 ❑ LAN: S1/S3/S5

Memory Address Map

Address	Size	Function
0000000 - 009FFFF	640 KB System Memory	Onboard DRAM
00A0000-00BFFFF	128 KB Video RAM	Reserved for Graphics Display Buffer Non-Cacheable
00C0000-00CFFFF	32 KB I/O Expansion ROM	Reserved for ROM on I/O Adapters
00D0000-00D3FFF	16 KB I/O Expansion ROM	Reserved for ROM on I/O Adapters
00D4000-00D7FFF	16 KB I/O Expansion ROM	Reserved for ROM on I/O Adapters
00D8000-00DBFFF	16 KB I/O Expansion ROM	Reserved for ROM on I/O Adapters
00DC000-00DFFFF	16 KB I/O Expansion ROM	Reserved for ROM on I/O Adapters
00E0000-00E7FFF	32 KB for SCSI BIOS	Reserved for SCSI BIOS
00E8000-00EFFFF	32 KB	Reserved Onboard
00F0000-00FFFFF	64 KB BIOS	System ROM BIOS (ROM) System RAM BIOS (DRAM)
0100000-0F9FFFF	System Memory	Onboard DRAM
0FA0000-0FFFFFF	384 KB I/O Card Memory	Reserved for Memory Map I/O Card Non-Cacheable
1000000-FFFFFFF	System Memory	Onboard DRAM

I/O Address Map

Hex Range	*Devices*
000-01F	DMA Controller-1
020-021	Interrupt Controller-1
040-043	System Timer
060-060	Keyboard Controller 8742
061-061	System Speaker
070-071	CMOS RAM Address and Real Time Clock
080-08F	DMA Page Register
0A0-0A1	Interrupt Controller-2
0C0-0DF	DMA Controller-2
0F0-0FF	Math Co-Processor
170-177	Secondary IDE
1F0-1F7	Primary IDE
278-27F	Parallel Printer Port 2
2F8-2FF	Serial Asynchronous Port 2
378-37F	Parallel Printer Port 1
3F0-3F5	Floppy Disk Controller
3F6-3F6	Secondary IDE
3F7-3F7	Primary IDE
3F8-3FF	Serial Asynchronous Port 1
0CF8	Configuration Address Register
0CFC	Configuration Data Register
778-77A	Parallel Printer Port 1

IRQ Assignment Map

IRQx	System Devices	Add-On-Card Devices
IRQ0	Timer	N
IRQ1	Keyboard	N
IRQ2	Reserved	N
IRQ3	Serial Port 2	Reserved
IRQ4	Serial Port 1	Reserved
IRQ5	Reserved	Reserved
IRQ6	Floppy Disk	Reserved
IRQ7	Parallel Port	Reserved
IRQ8	Real Time Clock	N
IRQ9	N	Reserved
IRQ10	N	Reserved
IRQ11	N	Reserved
IRQ12	PS/2 Mouse	Reserved
IRQ13	Numeric Processor	N
IRQ14	Embedded Hard Disk	Reserved
IRQ15	Reserved	Reserved

NOTE: N - Not be used

DRQ Assignment Map

DRQx	System Devices	Add-On-Card Devices
DRQ0	N	Reserved
DRQ1	N	Reserved
DRQ2	FDD	N
DRQ3	N	Reserved
DRQ4	Cascade	N
DRQ5	N	Reserved
DRQ6	N	Reserved
DRQ7	N	Reserved

NOTE: N - Not be used

Environmental Requirements

Item	Specifications
Temperature	
Operating	+5°C ~ +35°C
Non-operating	-20 ~ +60°C (Storage package), -10°C~+60°C (un-package)
Humidity	
Operating	15% to 80% RH, non-condensing
Non-operating	10% to 90% RH, non-condensing at 40°C
Vibration	
Operating (unpacked)	5 ~ 500Hz, 2.20g RMS random,10 minutes per axis in all 3 axes
Non-operating (packed)	5 ~ 500Hz, 1.09g RMS random,1 hour per axis in all 3 axes
Shock Operating	Half sine, 2g 11m seconds

Drop Test

Drop Test				
Definition	The protection ability of packing & cushion must be capable of withstanding, with no physical or functional demage, mechanical impact from height-specific drops.			
Test Standard				
Package Cross Weight		**Drop Height**		**Not of Drop**
KGs	lbs	CM	Inch	
0~9.1	0~20	76	30	10
9.1~18.2	20~40	61	24	10
18.2~27.3	40~60	46	18	10
27.3~45.4	60~100	31	12	10
10 drops : one corner, three edges, six surfaces				

Mechanical Specifications

Item	Specification
Dimensions(main footprint)	180(w)x352(H)x406(D)mm
Weight	4.74 Kg

Power Management Function (ACPI support function)

Device Standby Mode

- Independent power management timer for hard disk drive devices (0-15 minutes, time step=1 minute).
- Hard disk drive goes into Standby mode (for ATA standard interface).
- Disable V-sync to control the VESA DPMS monitor.
- Resume method: device activated (Keyboard for DOS, keyboard & mouse for Windows).
- Resume recovery time: 3-5 sec.

Global Standby Mode

- Global power management timer (2-120 minutes, time step=10 minute).
- Hard disk drive goes into Standby mode (for ATA standard interface).
- Disable H-sync and V-sync signals to control the VESA DPMS monitor.
- Resume method: Return to original state by pushing external switch button, modem ring in, keyboard and mouse for APM mode.
- Resume recovery time: 7-10 sec.

Suspend Mode

- Independent power management timer (2-120 minutes, time step=10 minutes) or pushing external switch button.
- CPU goes into SMM.
- CPU asserts STPCLK# and goes into the Stop Grant State.
- LED on the panel turns amber colour.
- Hard disk drive goes into SLEEP mode (for ATA standard interface).
- Disable H-sync and V-sync signals to control the VESA DPMS monitor.
- Ultra I/O and VGA chip go into power saving mode.
- Resume method: Return to original state by pushing external switch button, modem ring in, keyboard and mouse for APM mode.
- Return to original state by pushing external switch button, modem ring in and USB keyboard for ACPI mode.

ACPI

- ACPI specification 1.0b.
- S0, S1, S3 and S5 sleep state support.
- On board device power management support.
- On board device configuration support.

Dual Channel

Aspire T670/Acer Power F3 support the Dual Channel Technology. After operating the dual channel technology, the bandwidth of memory bus will add double up to 4GB/s.

Aspire T670/AcerPower FE inculde 4 DIMM slots, and each channel has two DIMM sockets as following:

- Channel A : DDR1, DDR3
- Channel B : DDR2 , DDR4

If you want to operate the Dual Channel Technology, please note the following explanations due to the limitation of Intel chipset specifications.

Memory Number		Description
1	Only one DDR memory module is installed ?	The Dual Channel Technology can't operate when only one DDR memory module is installed.
2	Two DDR memory modules are installed (the same memory size and type) ?	The Dual Channel Technology will operate when two memory modules are inserted individually into Channel A and B. If you install two memory modules in the same channel, the Dual Channel Technology will not operate.
3	Three DDR memory modules are installed ?	Pleae note that the Dual Channel Technology will not operate when three DDR memory modules are installed; part of them will not be detected.
4	Four DDR memory modules are installed ?	If you install four memory modules at the same time, the Dual Channel Technology will operate only when those modules have the same size and type.

NOTE: We strongly recommend user to slot two DDR memory modules into the DIMMs with the same color in order for Dual Channel Technology to work.

The following tables include all memory-installed combination types:

Dual Channel Technology (DS: Double Side, SS: Single Side)

	DDR1	DDR2	DDR3	DDR4
2 memory modules	DS/SS	X	DS/SS	X
	X	DS/SS	X	DS/SS
4 memory modules	DS/SS	DS/SS	DS/SS	DS/SS

Don't operate Dual Channel Technology (DS:Double Side, SS: Single Side)

	DDR1	DDR2	DDR3	DDR4
1 memory module	DS/SS	X	X	X
	X	DS/SS	X	X
	X	X	DS/SS	X
	X	X	X	DS/SS
2 memory module	DS/SS	DS/SS	X	X
	X	X	DS/SS	DS/SS
3 memory module	DS/SS	DS/SS	DS/SS	X
	DS/SS	DS/SS	X	DS/SS
	DS/SS	X	DS/SS	DS/SS
	X	DS/SS	DS/SS	DS/SS

System Utilities

BIOS (Basic Input and Output System) includes a CMOS SETUP utility which allows user to configure required setting or to active certain system features.

The CMOS SETUP saves the configuration in the CMOS SRAM of the mainboard. When the power is turned off, the battery on the mainboard supplies the necessary power to the CMOS SRAM.

When the power is turned on, pushing the <Del> button during the BIOS POST (Power-On Self Test) will take you to the CMOS SETUP screen. You can enter the BIOS setup screen by pressing “Ctrl+F1”. When setting up BIOS for the first time, it is recommended that you save the current BIOS to a disk in the event that BIOS needs to be reset to its original settings.

Q-Flash allows the user to quickly and easily update or backup BIOS without entering the operating system. BIOS is a Window s-based utility that doesn’t required users to boot to DOS before upgrading BIOS but directly download and update BIOS from the Internet.

Control Keys

Item	Description
↑ → ↓ ←	Move to selection
ENTER	Select Item
ESC	Main Menu: Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu, Exit current page and return to Main Menu.
PG UP	Increase the numeric value or make changes
PG DN	Decrease the numeric value or make changes
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2	Item Help
F5	Restore the previous CMOS value from CMOS, only for option Page Setup Menu
F7	Load the Optimized Defaults
F9	System Information
F10	Save all the CMOS changes, only for Main Menu

NOTE: Main Menu: This is the online description of the highlighted setup functions is displayed at the bottom of the screen.

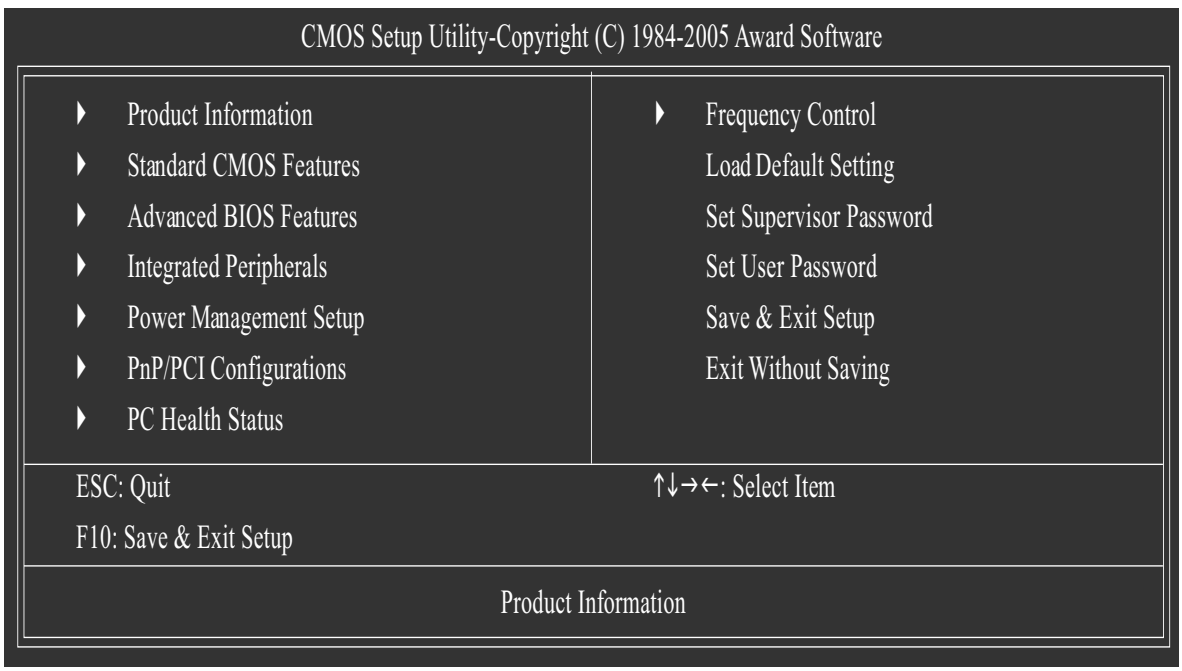
NOTE: Status Page Setup Menu/ Option Page Setup Menu: Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

Entering Setup

Once enter Award BIOS CMOS Setup Utility, the Main Menu (as figure below) will appear on the screen.

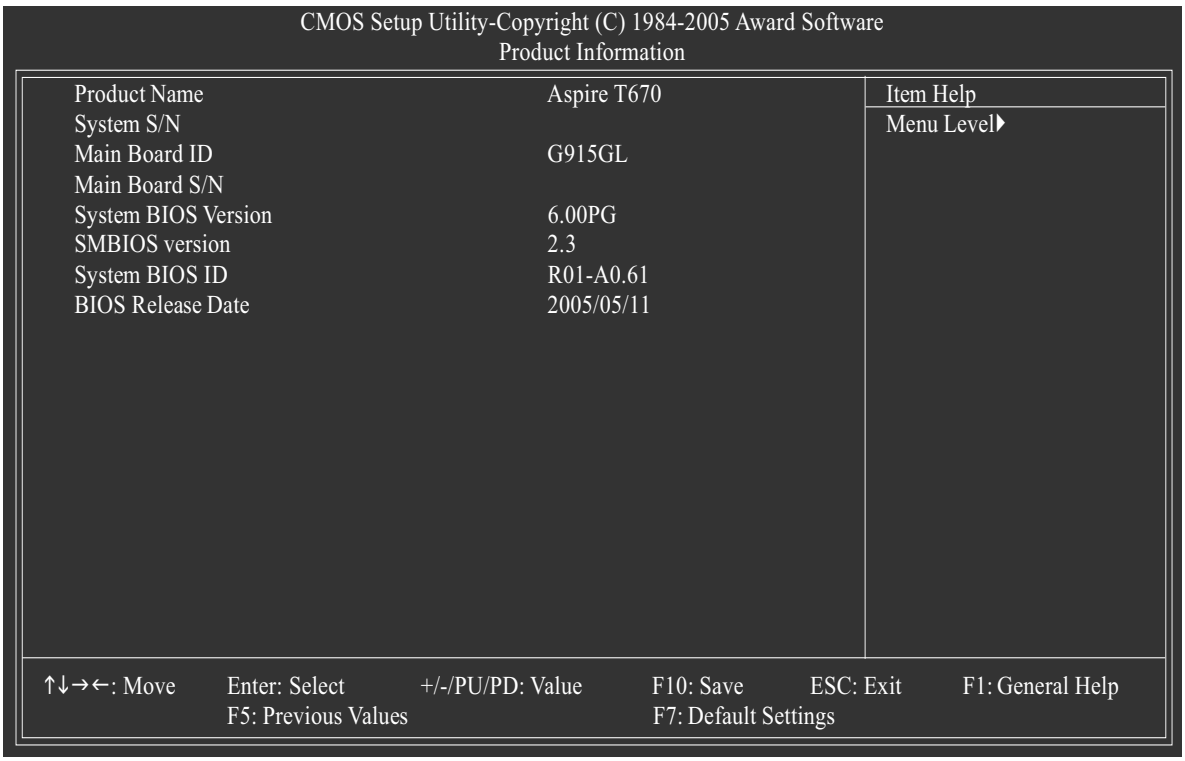
Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

Note: If you can't find the setting you want, please press "Alt+F4" to search the advanced option hidden. As for the hidden options, we have annotations following those with further setting screen menu.



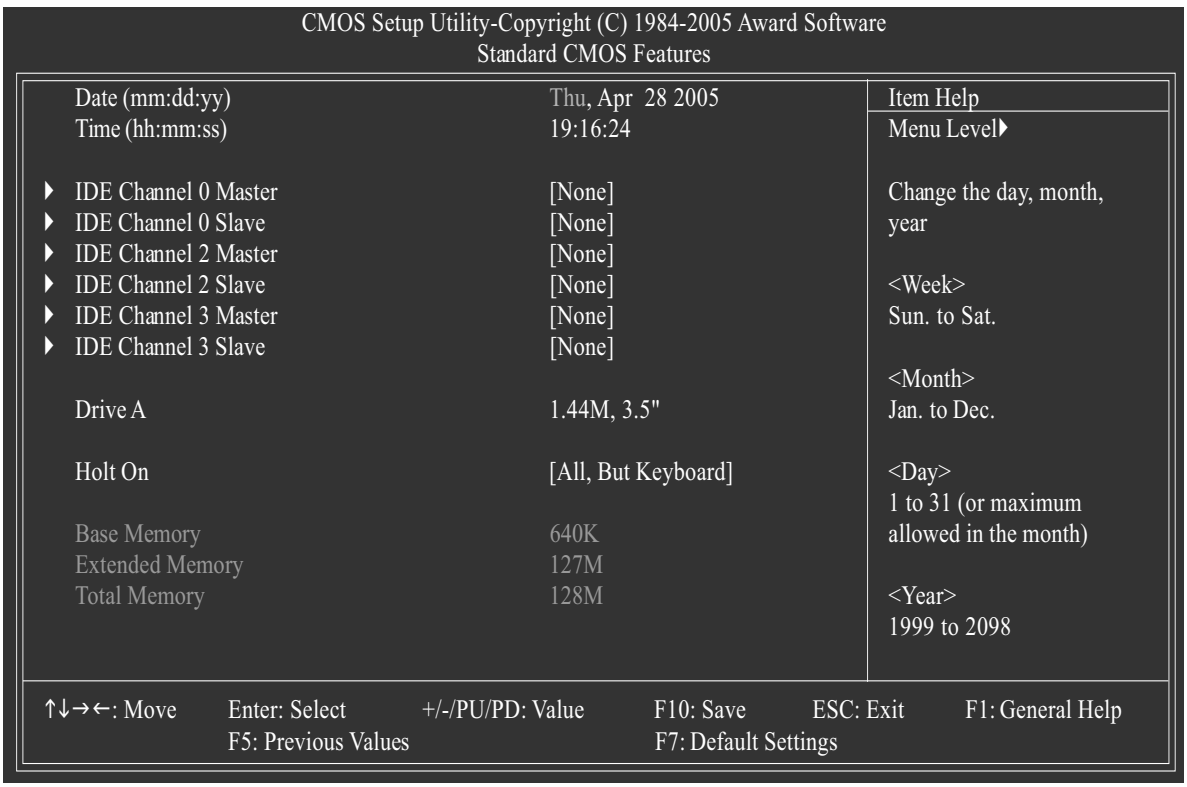
Parameter	Description
Product Information	This page shows the relevant information of the mainboard
Standard CMOS Features	This setup page includes all the items in standard compatible BIOS
Advanced BIOS Features	This setup page includes all the items of Award special enhanced features
Integrated Peripherals	This setup page includes all onboard peripherals
Power Management Setup	This setup page includes all the items of Green function features
PnP/PCI Configuration	This setup page includes all configurations of PCI&PnP ISA resources
PC Health Status	This setup page is the System auto detect Temperature, voltage, fan and speed
Frequency Control	This setup page is control CPU's clock and frequency ratio.
Load Default Settings	Default Settings indicates the value of the system parameters which the system would be in best performance configuration
Set Supervisor Password	Change, set or disable password. It allows you to limit access to the system and Setup, or just to Setup
Set User Password	Change, set or disable password. It allows you to limit access to the system
Save & Exit Setup	Save CMOS value settings to CMOS and exit setup
Exit Without Saving	Abandon all CMOS value changes and exit setup

Product Informatoin



Parameter	Description
Product Name	This item lists the product name
System S/N	This item lists the system serial number
Main Board ID	This item lists the mainboard ID
Main Board S/N	This item lists the mainboard serial number
System BIOS Version	This item lists the system BIOS version
SMBIOS Version	This item lists the system SMBIOS version
System BIOS ID	This item lists the system BIOS ID
BIOS Release Date	This item lists the BIOS release date

Standard CMOS Features



The following table describes the parameters found in this menu:

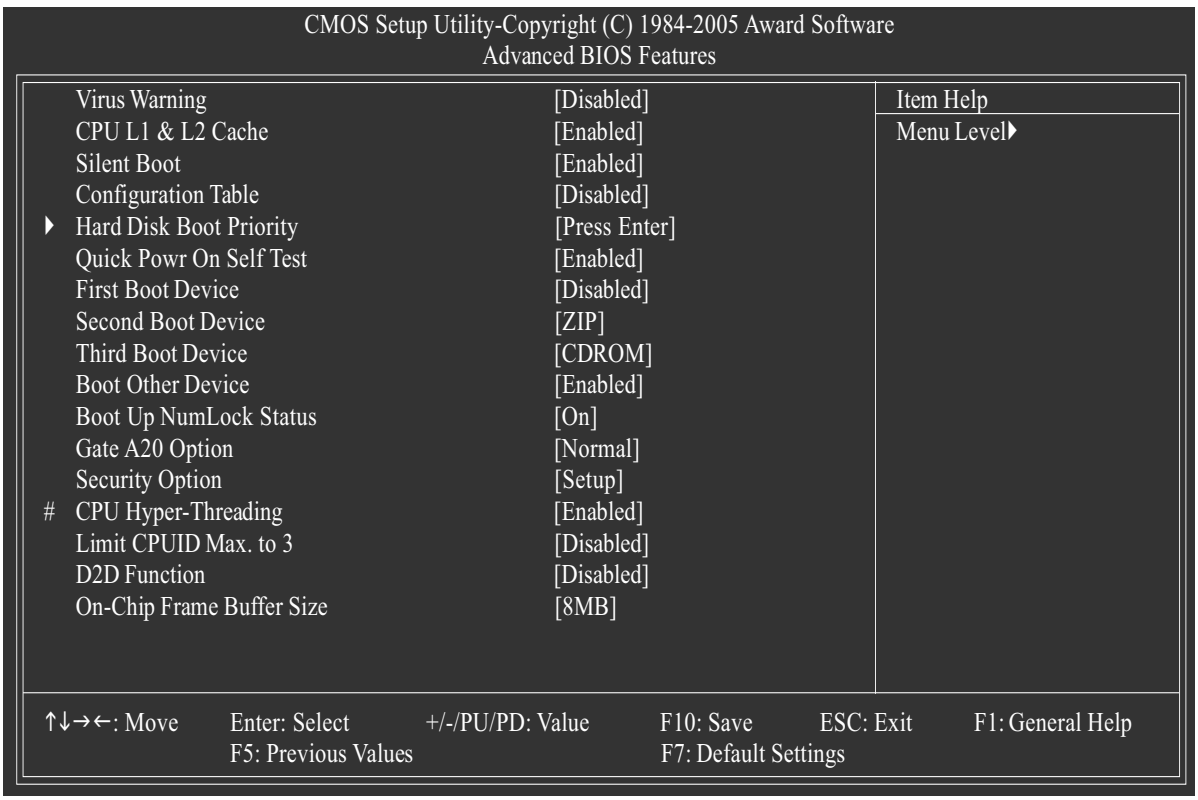
Parameter	Description	Options
Date	Lets you set the date following the weekday-month-day-year format	Week : from Sun. to Sat., determined by BIOS and is display only Month : from Jan. through Dec. Day : from 1 to 31 (or the maximum allowed in the month) Year : from 1999 to 2098
Time	Lets you set the time following the hour-minute-second format	The items format is <hour> <minut><second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00

Parameter	Description	Options
IDE Primary/Secondary Master, Slave	Allows you to configure the hard disk drive connected to the master port of IDE channel. To enter the IDE Master or Slave setup, press [Enter]. The IDE CD-ROM is always automatically detected.	IDE HDD Auto-Detection Press [Enter] to select this option for automatic device detection. IDE Primary/Secondary Master, Slave IDE Device Setup. You can use one of three methods: Auto : Allows BIOS to automatically detect IDE devices during POST (default) **None** : Select this if no IDE devices are used and the system will skip the automatic detection step and allow for faster system start up Manual : User can manually input the correct settings Access Mode : Use this to set the access mode for the hard drive. the four options are: CHS/LBA/Large/Auto (default: Auto) ❑ Cylinder : Number of cylinders ❑ Head : Number of heads ❑ Precomp : Write precomp ❑ Landing Zone : Landing Zone ❑ Sector : Number of sectors
Drive A	The category identifies the types of floppy disk drive A that has been installed in the computer.	None : No floppy drive installed 360K, 5.25” : 5.25 inch PC type standard drive ; 360Kbyte capacity 1.2M, 5.25” : 5.25 inch AT-type high-density drive; 1.2M byte capacity (3.5 inch when 3 Mode is Enabled) 720K, 3.5” : 3.5 inch double-sided drive; 720Kbyte capacity **1.44M, 3.5”** : 3.5 inch double-sided drive; 1.44Mbyte capacity 2.88M, 3.5” : 3.5 inch double-sided drive; 2.88Mbyte capacity
Halt On	This parameter enables you to control the system stops in case of Power On Self Test errors (POST)	No Errors : The system boot will not stop for any error that may be detected and you will be prompted All Errors : Whenever the BIOS detects a non-fatal error the system will be stopped **All, But Keyboard** : The system boot will not stop for a keyboard error; it will stop for all other errors (Default value) All, But Diskette : The system boot will not stop for a disk error; it will stop for all other errors All, But Disk/Key : The system boot will not stop for a keyboard or disk error; it will stop for all other errors.
Memory	The category is display-only which is determined by POST (Power On Self Test) of the BIOS.	

Parameter	Description	Options
Base Memory	The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.	
Extended Memory	The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1 MB in the CPU's memory address map.	
Total Memory	This item displays the memory size that used.	

Advanced BIOS Features

The following screen shows the Advanced BIOS Features:



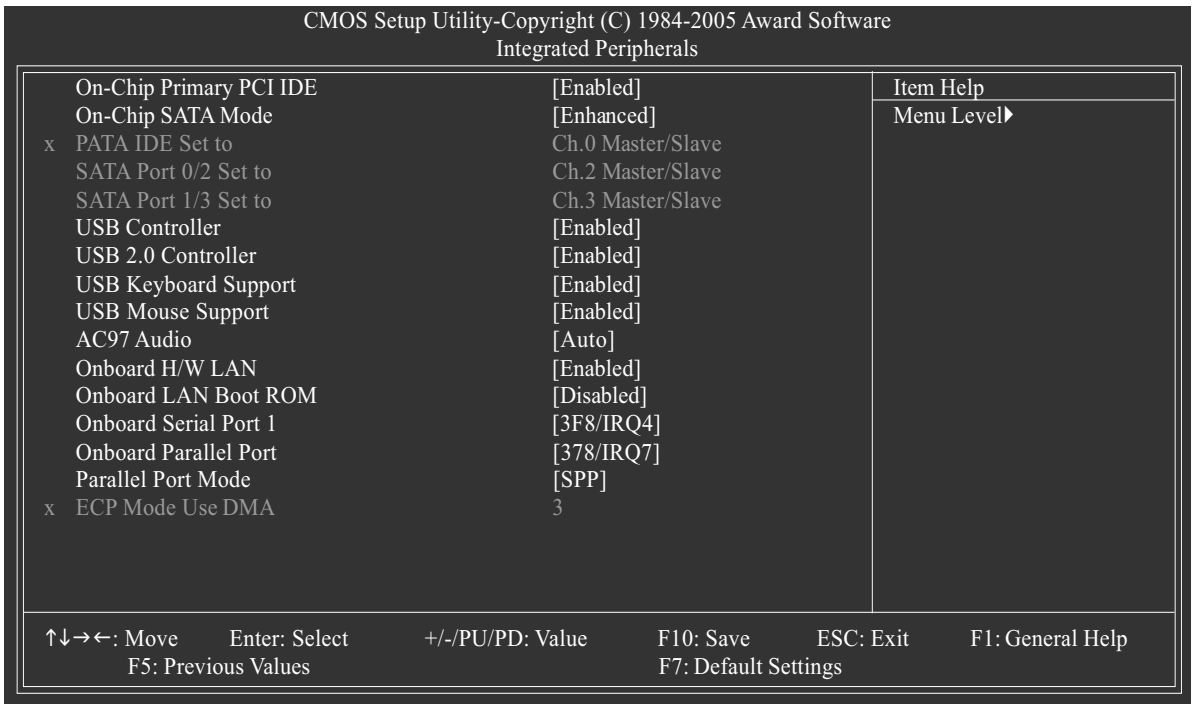
NOTE: "**#**" System will detect automatically and show up when you install the IntelR Pentium 4 processor with HT Technology.

Parameter	Description	Options
Virus Warning	This feature allows you to enable the VIRUS warning function for IDE Hard Disk boot sector protection. If this function is enabled and there is someone attempt to write data into this area, BIOS will show a warning message on screen and the alarm will beep.	Enabled **Disabled**
CPU L1 & L2 Cache	**Enabled** : Enable CPU L1 & L2 Cache function. Disabled : Disable this function.	
Silent Boot	This features allows you to enable or disable if the screen logo to display or no during POST	**Enabled** Disabled
Configuration Table	This feature allows you to enable or disable if showing summary screen or not	Enabled **Disabled**
Hard Disk Boot Priority	Select boot sequence for onboard(or add-on cards) SCSI, RAID, etc. Use <↑> or <↓>to select a device, then press<+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.	
Quick Power On Self Test	This feature allows the system to skip certain tests while booting. When this function is enabled, it will decrease the time needed to boot the system, which means to quick power on self test function	**Enabled** Disabled
First / Second / Third Boot Device	The item allows you to set the sequence of boot device where BIOS attempts to load the disk operating system.	**Floppy**, LS120, Hard Disk, CD-ROM, ZIP, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, Disabled

Parameter	Description	Options
Boot other Devices	This item allows you to enable or disable to boot from other device	**Enabled** Disabled
Boot Up NumLock Status	This item allows you to enable or disable to set keyboard is number keys or arrow keys	**Enabled** Disabled
Gate A20 Option	This option is used to set up the A20 signal control necessary for access to the 1MB memory.	Fast : Let chipset control Gate 20 **Normal** : A pin in the keyboard controller
Security Option	**Setup** : Ask password when enter setup. System : Ask password when system boot.	
CPU Hyper-Threading	This item is only available when CPU and the chipset support Hyper-Threading	**Enabled** : Enables CPU Hyper Threading Feature. Please note that this feature is only working for operating system with multi processors mode supported. Disabled : Disables CPU Hyper Threading
Limit CPUID Max. to 3	Limit CPU ID function to 3. It helps to solve old OS like NT4 installing issue.	Enabled : Limit CPUID Maximum value to 3 when use older OS like NT4. **Disabled** : Disables CPUID Limit for Windows XP
D2D Function	Enabled : Enable this function **Disabled** : Disable this function	
On-Chip Frame Buffer Size	1MB : Set On-chip frame buffer size to 1MB. 4MB : Set On-chip frame buffer size to 4MB **8MB** : Set On-chip frame buffer size to 8MB 16MB : Set On-chip frame buffer size to 16MB 32MB : Set On-chip frame buffer size to 32MB	

Integrated Peripherals

All onboard peripherals can be set up through this menu.

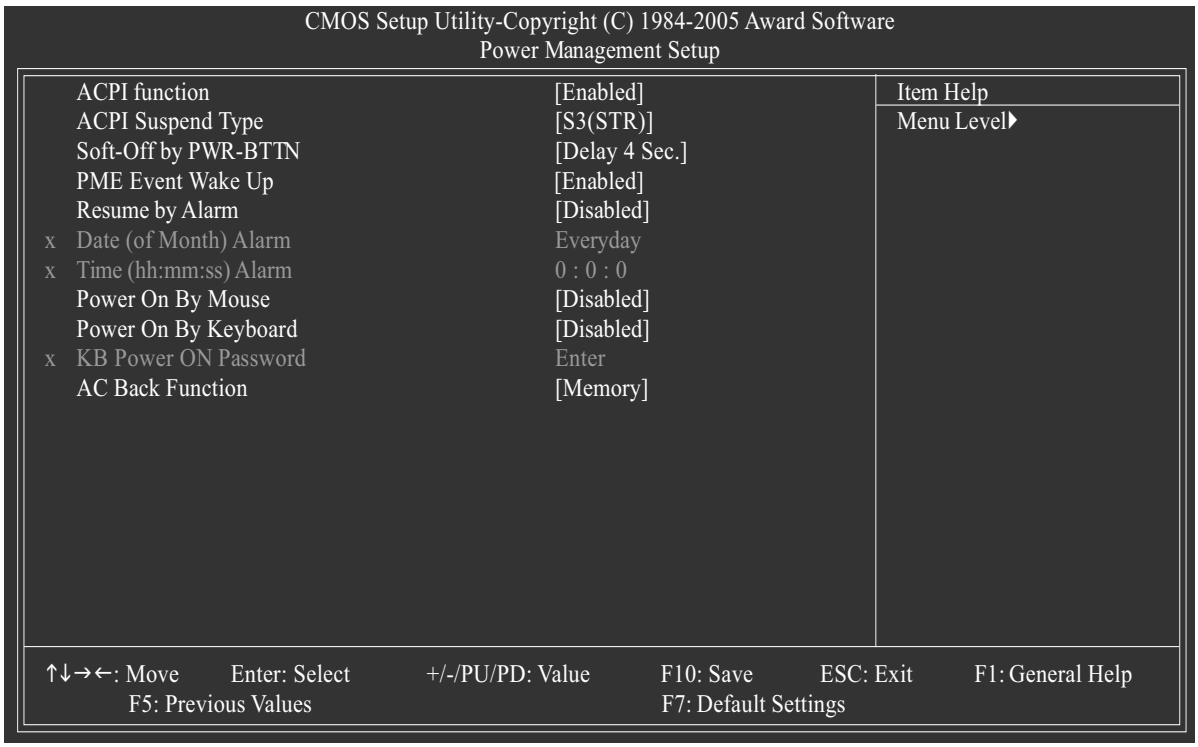

CMOS Setup Utility-Copyright (C) 1984-2005 Award Software
Integrated Peripherals
On-Chip Primary PCI IDE [Enabled]
On-Chip SATA Mode [Enhanced]
x PATA IDE Set to Ch.0 Master/Slave
SATA Port 0/2 Set to Ch.2 Master/Slave
SATA Port 1/3 Set to Ch.3 Master/Slave
USB Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Keyboard Support [Enabled]
USB Mouse Support [Enabled]
AC97 Audio [Auto]
Onboard H/W LAN [Enabled]
Onboard LAN Boot ROM [Disabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [SPP]
x ECP Mode Use DMA 3
Item Help
Menu Level
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F7: Default Settings

Parameter	Description	Options
On-Chip Primary PCI IDE	**Enabled** : Enable onboard 1st channel IDE port. Disabled : Disable onboard 1st channel IDE port	
On-Chip SATA Mode	Disabled : Disable this function Auto : BIOS will auto detect Combined : Set On-Chip SATA mode to Combined, you can use up to 4 HDDs on the motherboard; 2 for SATA and the other for PATA IDE. **Enhanced** : Set On-Chip SATA mode to Enhanced, the motherboard allows up to 6 HDDs to use Non-Combined : Set On-Chip SATA mode to Non-Combined, SATA will be simulated to PATA mode.	
PATA IDE Set to	Ch.1 Master/Slave : Set PATA IDE to Ch. 1 Master/Slave. **Ch.0 Master/Slave** : Set PATA IDE to Ch. 0 Master/Slave.	
SATA Port 0/2 Set to	This value will auto make by the setting "On-Chip SATA Mode" and "PATA IDE Set to". If PATA IDE were set to Ch. 1 Master/Slave, this function will auto set to Ch. 0 Master/ Slave.	
SATA Port 1/3 Set to	This value will auto make by the setting "On-Chip SATA Mode" and "PATA IDE Set to". If PATA IDE were set to Ch. 0 Master/Slave,this function will auto set to Ch. 1 Master/ Slave.	
USB 2.0 Controller	Enable this item if the system supports USB 2.0	**Enabled** : Enable USB 2.0 Controller Disabled : Disable USB 2.0 Controller
USB Controller	This item is used to enable or disable the on-chip USB	**Enabled** : Enable USB Controller Disabled : Disable USB Controller

Parameter	Description	Options
USB Keyboard Support	This item lets you enable or disable the USB keyboard driver within the onboard BIOS. The keyboard driver is simulates legacy keyboard command and lets you use a USB keyboard during POST or after boot if you do not have a USB driver in the operating system	**Enabled** : Enable USB Keyboard Support Disabled : Disable USB Keyboard Support
USB Mouse Support	This item lets you enable or disable the USB mouse driver within the onboard BIOS. The keyboard driver simulates legacy mouse command and lets you use a USB mouse during POST or after boot if you do not have a USB driver in the operating system.	**Enabled** : Enable USB Mouse Support Disabled : Disable USB Mouse Support
AC97 Audio	**Auto** :Auto detect AC97 audio function Disabled : Disable AC97 audio function	
Onboard H/W LAN	**Enabled** : Enable Onboard H/W LAN function Disabled : Disable this function	
Onboard LAN Boot ROM	This function decide whether to invoke the boot ROM of the onboard LAN chip	Enabled **Diabled**
Onboard Serial Port 1	This option is used to assign the I/O address and interrupt request (IRQ) for onboard serial port 1	Auto : BIOS will automatically setup the port 1 or 2 address **3F8/IRQ4 (Serial Port 1 default)** 2F8/IRQ3 (Serial Port 2 default) 3E8/IRQ4 2E8/IRQ3 Diabled : Disable onboard Serial port 1
Parallel Port Mode	**SPP** : Using Parallel port as Standard Parallel Port EPP : Using Parallel port as Enhanced Parallel Port ECP : Using Parallel port as Extended Capabilities Port ECP+EPP : Using Parallel port as ECP & EPP mode	
ECP Mode Use DMA	3 : Set ECP Mode Use DMA to 3 1 : Set ECP Mode Use DMA to 1	

Power Management Setup

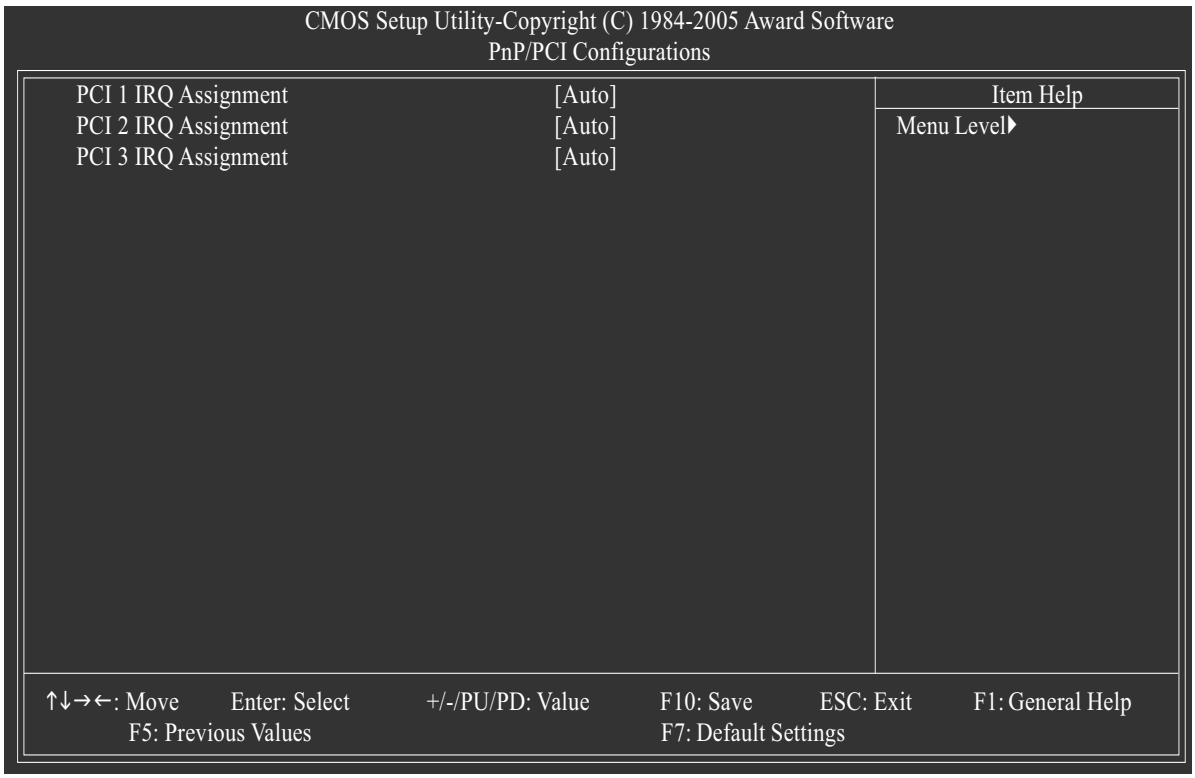
The Power Management menu lets you configure your system to most effectively save energy while operating in a manner consistent with your own style of computer use.


CMOS Setup Utility-Copyright (C) 1984-2005 Award Software
Power Management Setup
ACPI function [Enabled]
ACPI Suspend Type [S3(STR)]
Soft-Off by PWR-BTTN [Delay 4 Sec.]
PME Event Wake Up [Enabled]
Resume by Alarm [Disabled]
x Date (of Month) Alarm Everyday
x Time (hh:mm:ss) Alarm 0 : 0 : 0
Power On By Mouse [Disabled]
Power On By Keyboard [Disabled]
x KB Power ON Password Enter
AC Back Function [Memory]
Item Help
Menu Level
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F7: Default Settings

Parameter	Description	Options
ACPI Function	This item allows you to enable or disable the ACPI function	**Enabled** Disabled
ACPI Suspend Type	This item specifies the power saving modes for ACPI function. S1(POS): The S1 sleep mode is a low power state. In this state, no system context (CPU or chipset) is lost and hardware maintains all system context. S3 (STR): The S3 sleep mode is s power-down state in which power is supplied only to essential components such as main memory and wake-capable devices and all system context is saved to main memory. The information stored in memory will be used to restore the PC to the previous state when an wake-up event occurs.	S1 (POS) : Set ACPI suspend type to S1/POS(Power On Suspend). **S3 (STR)** : Set ACPI suspend type to S3/STR
Soft-off by PWR-BTTN	This feature allows users to configure the power button function.	Instand-off : Press down button then power off instantly **Delay 4 Sec.** : Press power button 4 sec. to power off. Enter suspend if button is pressed less than 4 sec.
PME Event Wake Up	Disabled : Disable this function **Enabled** : Enable PME Event Wake up	

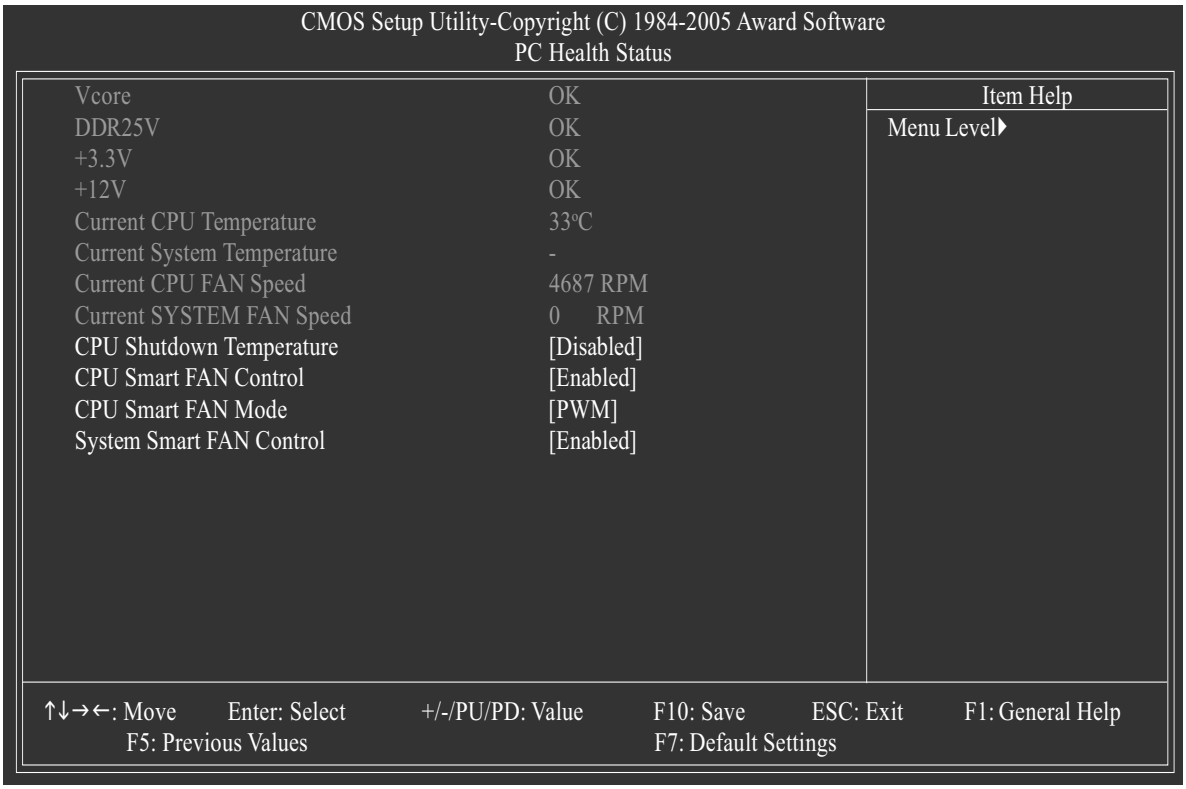
Parameter	Description	Options
Resume by Alarm	You can set “Resume by Alarm” item to enabled and key in Data/Time to power on system	**Disabled** : Disable this function Enabled : Enable alarm function to Power On system If RTC Alarm Lead To Power On is Enabled. Date (of Month) Alarm : Everyday, 1~31 Time (hh:mm:ss) Alarm: (0.~23):(0~59):(0~59)
Power On By Mouse	**Disabled** : Disable this function Double Click : Double click on PS/2 mouse left button to power on the system	
Power On By Keyboard	Password : Enter from 1 to 5 characters to set the Keyboard Power On Password Disabled : Disabled this function Keyboard 98 : If your keyboard have "POWER Key" button, you can press the key to power on the system.	
KB Power ON Password	When "Power On by Keyboard" set at Password, you can set the password here. Enter : Input password (from 1 to 5 characters) and press Enter to set the Keyboard Power On password.	
AC Back Function	Soft-Off : When AC-power back to the system, the system will be in "Off" state. Full-On : When AC-power back to the system, the system always in "On" state. **Memory** : When AC-power back to the system, the system will return to the Last state before AC-power off.	

PnP/PCI Configuration


CMOS Setup Utility-Copyright (C) 1984-2005 Award Software
PnP/PCI Configurations
PCI 1 IRQ Assignment [Auto]
PCI 2 IRQ Assignment [Auto]
PCI 3 IRQ Assignment [Auto]
Item Help
Menu Level
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F7: Default Settings

Parameter	Option
PCI 1 IRQ Assignment	**Auto** : Auto assign IRQ to PCI 1 3,4,5,7,9,10,11,12,14,15 : Set IRQ 3,4,5,7,9,10,11,12,14,15 to PCI 1
PCI 2 IRQ Assignment	**Auto** : Auto assign IRQ to PCI 2 3,4,5,7,9,10,11,12,14,15 : Set IRQ 3,4,5,7,9,10,11,12,14,15 to PCI 2
PCI 3 IRQ Assignment	**Auto** : Auto assign IRQ to PCI 3 3,4,5,7,9,10,11,12,14,15 : Set IRQ 3,4,5,7,9,10,11,12,14,15 to PCI 2

PC Health

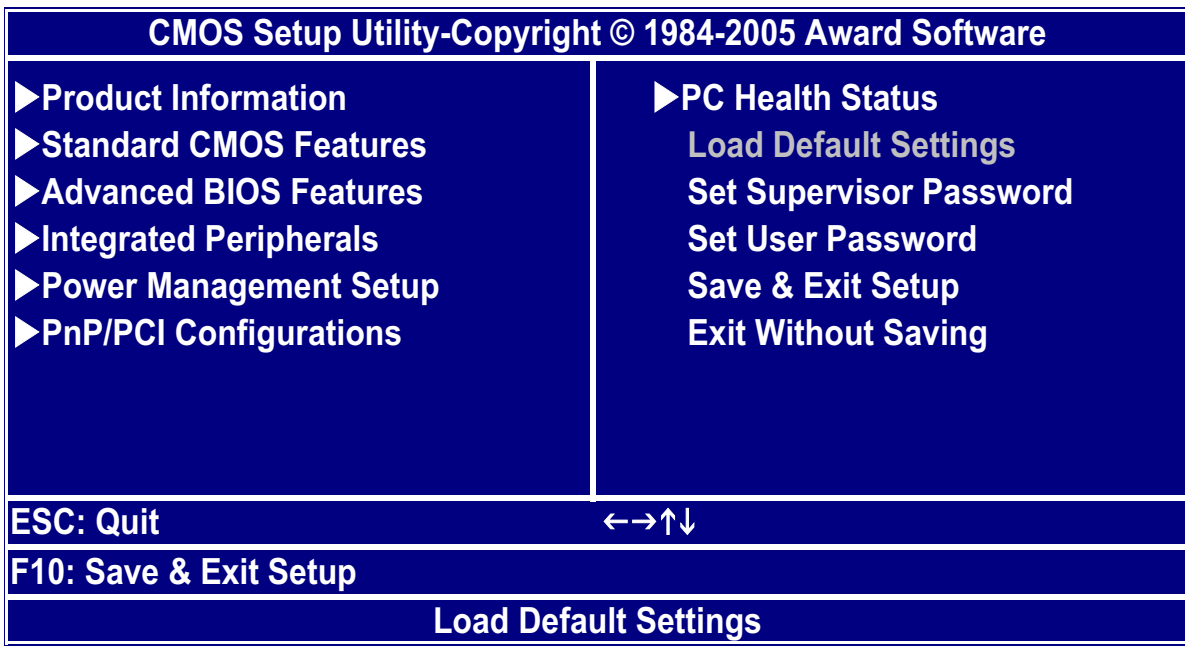

CMOS Setup Utility-Copyright (C) 1984-2005 Award Software
PC Health Status
Vcore OK
DDR25V OK
+3.3V OK
+12V OK
Current CPU Temperature 33°C
Current System Temperature -
Current CPU FAN Speed 4687 RPM
Current SYSTEM FAN Speed 0 RPM
CPU Shutdown Temperature [Disabled]
CPU Smart FAN Control [Enabled]
CPU Smart FAN Mode [PWM]
System Smart FAN Control [Enabled]
Item Help
Menu Level
↑↓→←: Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F7: Default Settings

The following table describes the parameters found in this menu:

Parameter	Description	
Current Voltage (V) Vcore /DDR18V/ +3.3V/+12V	Detect system's voltage status automatically	
Ambient Temperature	Delect ambient temperature automatically	
CPU Temperature	Detect CPU Temperature automatically	
CPU / SYSTEM FAN Speed (RPM)	Detect CPU/SYSTEM Fan Speed status automatically	
CPU Warning Temperature	CPU warning beep alerts as user selected	60 ° C/140 ° F 70 ° C/158 ° F 80 ° C/176 ° F 90 ° C/194 ° F **Disabled** : Disable this function
SYS FAN Speed Control	This item allows you to enable or disable the SMART fan control function	**Enable** Disabled
Hidden Setting		
CPU FAN Slope PWM	**2**	
CPU FAN Speed Control	**Enabled**/Disabled	
Temp Limit of FAN Start	**45**	
CPU FAN Start PWM	**42**	
SYS FAN Start PWM	**44**	

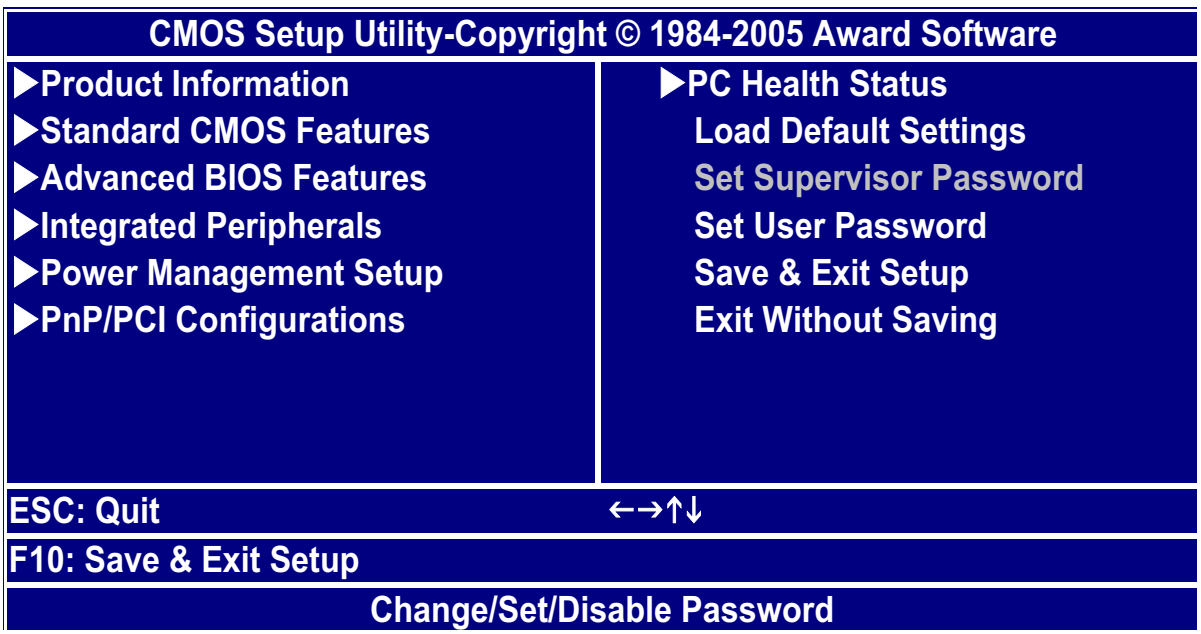
Load Default Settings

Selecting the field loads the factory defaults for BIOS and Chipset Features which the system automatically. detects.



Set Supervisor/User Password

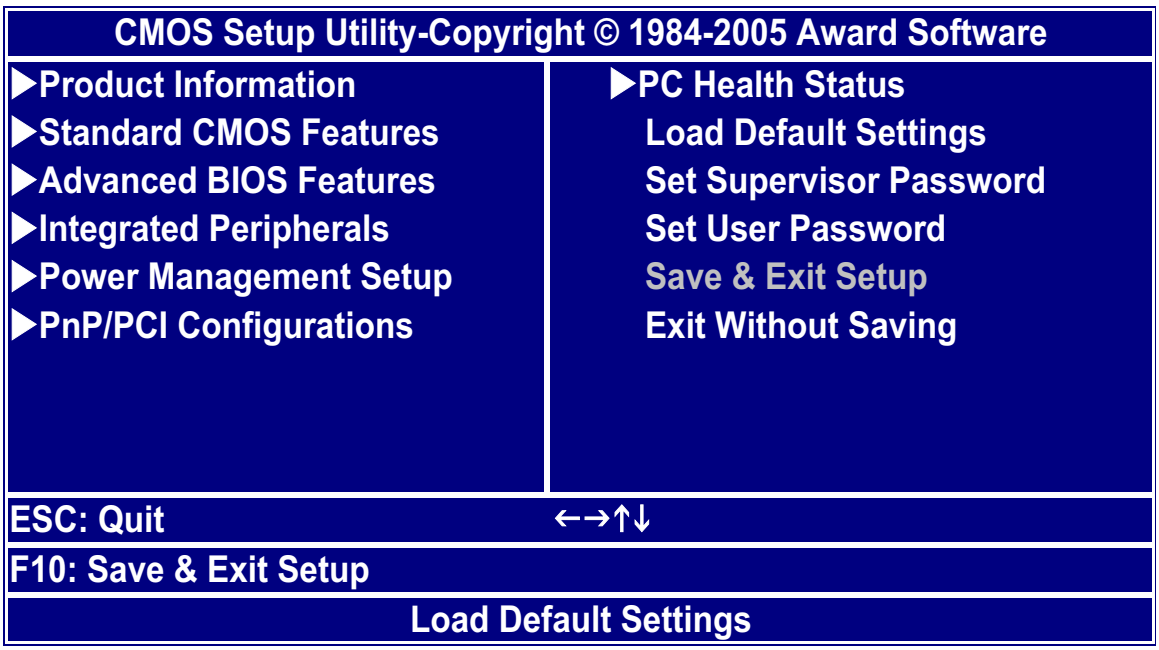
When this function is selected, the following message appears at the center of the screen to assist you in creating a password.



The access rights and permission associated with the Supervisor password are higher than those os a regular User password. The Supervisor password can be used to start the system or modify the CMOS settings. The User password can also start the system. While the User password

Save & Exit Setup

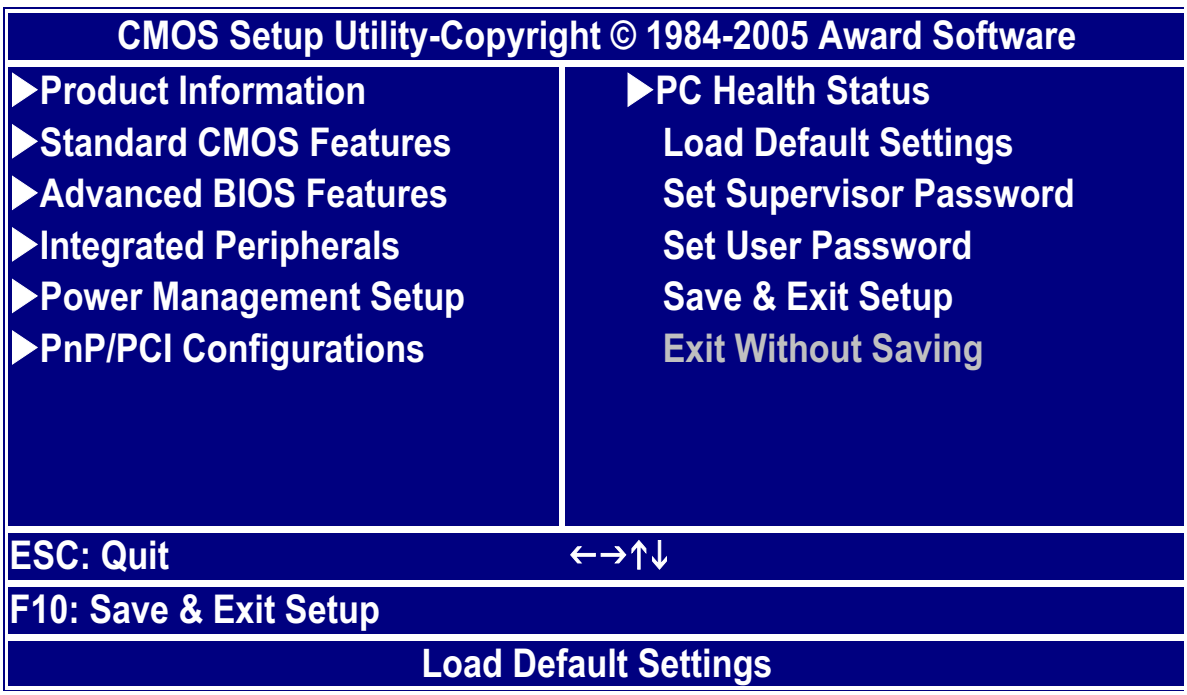
Highlight this item and press <Enter> to save the changes that you have made in the Setup Utility and exit the Setup Utility.



When the Save and Exit dialog box appears, press <Y> to save and exit, or press <N> to return to the main menu.

Exit Without Saving

Highlight this item and press <Enter> to discard any changes that you have made in the Setup Utility and exit the Setup Utility.



When the Exit Without Saving dialog box appears, press <Y> to discard changes and exit, or press <N> to return to the main menu.

NOTE: If you have made settings that you do not want to save, use the "Exit Without Saving" item and press <Y> to discard any changes you have made.

Machine Disassembly and Replacement

This chapter contains step-by-step procedures on how to disassemble the Aspire T670 / AcerPower FE desktop computer for maintenance and troubleshooting.

NOTE: The screws for the different components vary in size. During the disassembly process, group the screws with the corresponding components to avoid mismatches when putting back the components.

Model	AP FE	ASPIRE T670
Bezel	P451	S43
Chassis	H401	H401
Region	W.W.(mainly China)	W.W.

General Information

Before You Begin

Before proceeding with the disassembly procedure, make sure that you do the following:

1. Turn off the power to the system and all peripherals.
2. Unplug the AC adapter and all power and signal cables from the system.

Disassembling the System

Opening the Housing

This section tells you how to open the housing cover when you need to install additional components inside the system unit.

CAUTION: Before you proceed, make sure that you have turned off the system and all peripherals connected to it.

Removing the Housing

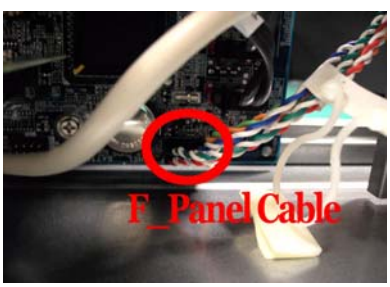
1. Turn off the system power and unplug all cables.
2. Place the system unit on a flat, steady surface.

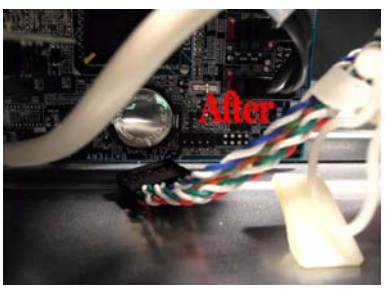
3. Press down the Lock-Handle. Then slide the side panel as shown.

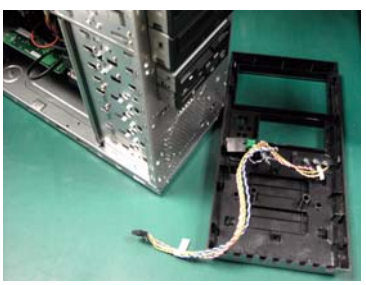
4. Remove the two screws on the rear side to detach another side panel.

5. Release the three latches to detach the front bezel located inner position.

6. Disconnect the Front Panel Cable from the mainboard then detach the front bezel.

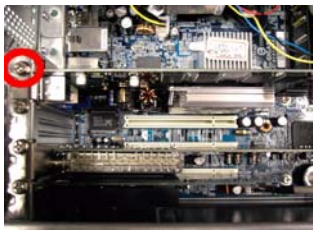
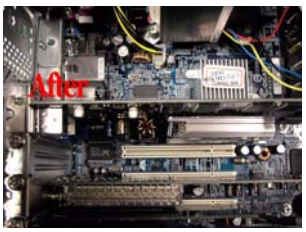


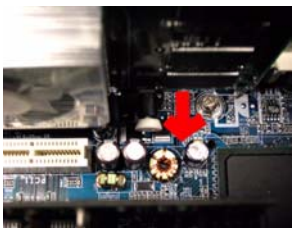




Remvoing the Add-on Card

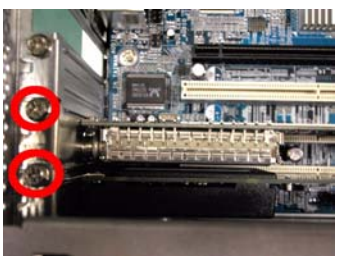
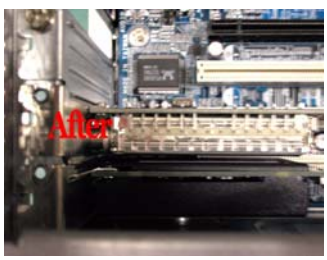
1. Remove the one screw.
2. Pull forward the tab to release the VGA card.



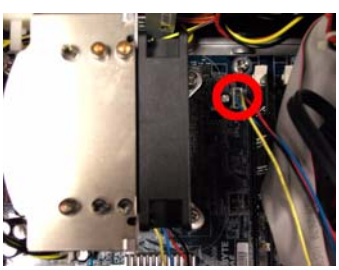
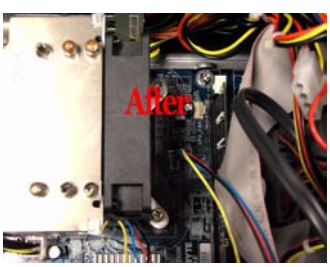
3. Remove those two screws.

Detach the TV Tuner Card and Modem Card.

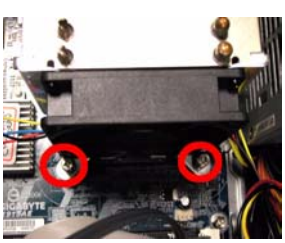
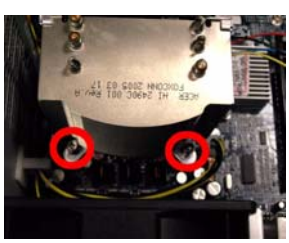
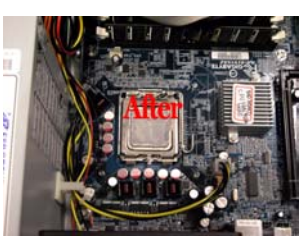



Removing the Heatsink and CPU

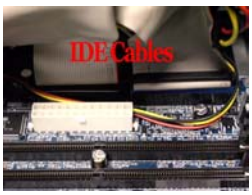
1. Disconnect the CPU FAN cable from mainboard.

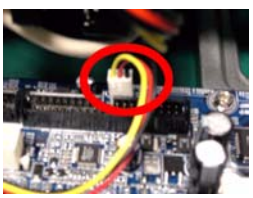
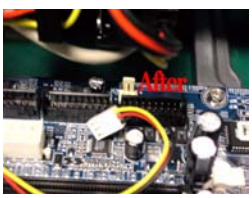
2. Remove the two screws on each side of the Heatsink module.

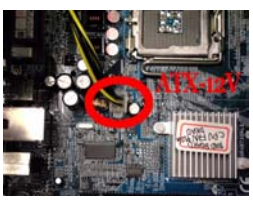
1. Disconnect the two IDE Cables from the mainboard.



2. Disconnect the SYS FAN cable from the mainboard.

3. Disconnect the the ATX 12V cable from the mainboard.

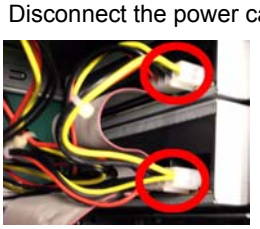


Disconnect the Cable from Device

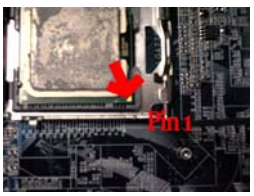
1. Disconnect the SATA Cables from the rear of HDD.

2. Disconnect the power cable and IDE cable from the rear of FDD.

3. Disconnect the power cables and IDE from the rear of ODD.



1. Rise the level bar to the 90-degree directly.
2. Rise the CPU cap to the straight.
3. Detach the CPU from the socket.



Remvoing the Memory

1. Press the both tabs to release the DIMM.
2. Detach the memory out from the slots.

Disconnecting the Cables

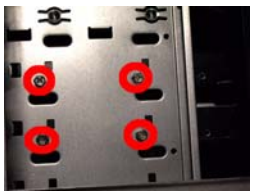
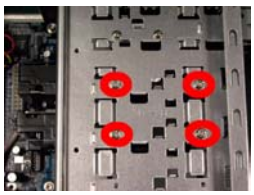
1. Disconnect the Front USB cable from the mainboard.

2. Disconnect the SATA Cables from the mainboard.

3. Disconnect the Power Cable from the mainboard.

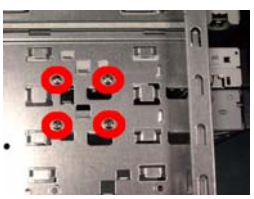
Removing the HDD

1. Unsecure the four screws.
2. Turn another side to unsecure another four screws.
3. Pull out the HDD from the chassis.

Removing the FDD and Card Reader

1. Unsecure the four screws from the cage.
2. Pull the FDD and card reader out from the chassis.

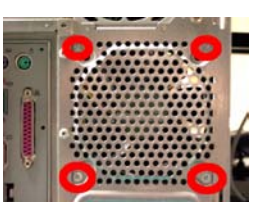
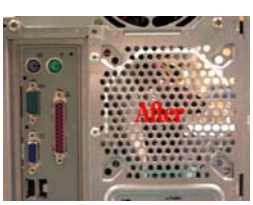


Removing the ODD

1. Unsecure the six screws to release the ODD from chassis.

Removing the System FAN

1. Remove the four screws.
2. Detach the system fan from the chassis.

Removing the Power Supply

1. Unsecure the four screws.
2. Detach the power supply out from the chassis.

Removing the Mainboard

1. Unsecure the eight screws.
2. Detach the mainboard out from the chassis.

Troubleshooting

This chapter provides troubleshooting information for the Aspire T670/AcerPower FE .

- Power-On Self-Test (POST)
- Index of Error Message
- Index of Error Symptoms
- Undetermined Problems

Power-On Self-Test (POST)

Each time you turn on the system, the Power-on Self Test (POST) is initiated. Several items are tested during POST, but is for the most part transparent to the user.

The Power-On Self Test (POST) is a BIOS procedure that boots the system, initializes and diagnoses the system components, and controls the operation of the power-on password option. If POST discovers errors in system operations at power-on, it displays error messages on screen, generates a check point code at port 80h or even halts the system if the error is fatal.

The main components on the main board that must be diagnosed and/or initialized by POST to ensure system functionality are as follows:

- Microprocessor with built-in numeric co-processor and cache memory subsystem
- Direct Memory Access (DMA) controller
- Interrupt system
- Three programmable timers
- ROM subsystem
- RAM subsystem
- CMOS RAM subsystem and real time clock/calendar with battery backup
- Onboard parallel interface controller
- Embedded hard disk interface and one diskette drive interface
- Keyboard and auxiliary device controllers
- 1.44M floppy controller
- I/O ports
  - One parallel port
  - One PS/2-compatible mouse port
  - One PS/2-compatible keyboard port

NOTE: When Post executes a task, it uses a series of preset numbers called check points to be latched at port 80h, indicating the stages it is currently running. This latch can be read and shown on a debug board.

The following table describes the BIOS common tasks carried out by POST. Each task is denoted by an unique check point number. For other unique check point numbers that are not listed in the table, refer to the corresponding product service guide.

Post Checkpoints List: The list may vary accordingly depending on your BIOS

.

Checkpoint	Description
CFh	Test CMOS R/W functionality
C0h	Early chipset initialization: -Disable shadow RAM -Disable L2 cache (socket 7 or below) -Program basic chipset registers
C1h	Detect memory -Auto-detection of DRAM size, type and ECC. -Auto-detection of L2 cache (socket 7 or below)
C3h	Expand compressed BIOS code to DRAM
C5h	Call chipset hook to copy BIOS back to E000 & F000 shadow RAM.
01h	Expand the Xgroup codes locating in physical address 1000:0
02h	Reserved

.

Checkpoint	Description
03h	Initial Superio_Early _Init switch
04h	Reserved
05h	1. Blank out screen 2. Clear CMOS error flag
06h	Reserved
07h	1. Clear 8042 interface 2. Initialize 8042 self-test
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved
0Ah	1. Disable PS/2 mouse interface (optional) 2. Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/Q chips.
0Bh	Reserved
0Ch	Reserved
0Dh	Reserved
0Eh	Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker.
0Fh	Reserved
10h	Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support.
11h	Reserved
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved
16h	Initial Early_Init_Onboard_Generator switch.
17h	Reserved
18h	Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686)
19h	Reserved
1Ah	Reserved
1Bh	Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved
1Dh	Initial Early_PM_INIT switch.
1Eh	Reserved
1Fh	Load keyboard matrix (notebook platform)
20h	Reserved
21h	HPM initialization (notebook platform)
22h	Reserved

.

Checkpoint	Description
23h	1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. 4. Onboard clock generator initialization. Disable respective clock resource to empty PCI & DIMM slots. 5. Early PCI initialization -Enumerate PCI bus number -Assign memory & I/O resource -Search for a valid VGA device and VGA BIOS, and put it into C000:0
24h	Reserved
25h	Reserved
26h	Reserved
27h	Initialize INT 09 buffer
28h	Reserved
29h	1. Program CPU internal MTRR (P6 & PII) for 0-640K memory address. 2. Initialize the APIC for Pentium class CPU. 3. Program early chipset according to CMOS setup. Example: onboard IDE controller. 4. Measure CPU speed. 5. Invoke video BIOS.
2Ah	Reserved
2Bh	Reserved
2Ch	Reserved
2Dh	1. Initialize multi-language 2. Put information on screen display, including Award title, CPU type, CPU speed...
2Eh	Reserved
2Fh	Reserved
30h	Reserved
31h	Reserved
32h	Reserved
33h	Reset keyboard except Winbond 977 series Super I/O chips.
34h	Reserved
35h	Reserved
36h	Reserved
37h	Reserved
38h	Reserved
39h	Reserved
3Ah	Reserved
3Bh	Reserved

.

Checkpoint	Description
3Ch	Test 8254.
3Dh	Reserved
3Eh	Test 8259 interrupt mask bits for channel 1
3Fh	Reserved
40h	Test 8259 interrupt mask bits for channel 2
41h	Reserved
42h	Reserved
43h	Test 8259 functionality
44h	Reserved
45h	Reserved
46h	Reserved
47h	Initialize EISA slot
48h	Reserved
49h	1. Calculate total memory by testing the last double word of each 64K. 2. Program writes allocation for AMD K5 CPU.
4Ah	Reserved
4Bh	Reserved
4Ch	Reserved
4Dh	Reserved
4Eh	1. Program MTRR of M1 CPU. 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved
50h	Initialize USB
51h	Reserved
52h	Test all memory (clear all extended memory to 0)
53h	Reserved
54h	Reserved
55h	Display number of processors (multi-processor platform)
56h	Reserved
57h	1. Display PnP logo 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved
5Bh	(Optional Feature) Show message for entering AWDFLASH.EXE from FDD (optional)
5Ch	Reserved

.

Checkpoint	Description
5Dh	1. Initialize Init_Onboard_Super_IO switch. 2. Initialize Init_Onboard_AUDIO switch.
5Eh	Reserved
5Fh	Reserved
60h	Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility.
61h	Reserved
62h	Reserved
63h	Reserved
64h	Reserved
65h	Initialize PS/2 Mouse
66h	Reserved
67h	Prepare memory size information for function call: INT 15h ax=E820h
68h	Reserved
69h	Turn on L2 cache
6Ah	Reserved
6Bh	Program chipset registers according to items described in Setup& Auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to “AUTO”
6Eh	Reserved
6Fh	1. Initialize floppy controller 2. Set up floppy related fields in 40: hardware.
70h	Reserved
71h	Reserved
72h	Reserved
73h	(Optional Feature) Enter AWDFLASH.EXE if: -AWDFLASH is found in floppy drive -ALT+F2 is pressed
74h	Reserved
75h	Detect & install all IDE devices: HDD, LS120, ZIP,CDROM.....
76h	Reserved
77h	Detect serial ports & parallel ports
78h	Reserved
79h	Reserved
7Ah	Detect & install co-processor
7Bh	Reserved
7Ch	Reserved
7Dh	Reserved

.

Checkpoint	Description
7Eh	Reserved
7Fh	1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: Clear EPA or customization logo.
80h	Reserved
81h	Reserved
82h	1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full screen logo) 3. If password is set, ask for password.
83h	Save all data in stack back to CMOS.
84h	Initialize ISA PnP boot devices.
85h	1. USB final Initialization 2. NET PC: Build SYSID structure 3. Switch screen back to text mode. 4. Set up ACPI table at top of memory. 5. Invoke ISA adapter ROMs. 6. Assign IRQs to PCI devices 7. Initialize APM 8. Clear noise of IRQs
86h	Reserved
87h	Reserved
88h	Reserved
89h	Reserved
90h	Reserved
91h	Reserved
92h	Reserved
93h	Read HDD boot sector information for Trend Anti-Virus code
94h	1. Enable L2 cache 2. Program boot up speed 3. Chipset final initialization 4. Power management final initialization 5. Clear screen & display summary table 6. Program K6 write allocation 7 Program P6 class write combining.
95h	1. Program daylight saving 2. Update keyboard LED & typematic rate
96h	1. Build MP table 2. Build & update ESCD 3. Set CMOS century to 20h or 19h 4. Load CMOS time into DOS timer tick 5. Build MSIRQ routing table
FFh	Boot attempt (INT 19h)

POST Error Messages List

If you cannot run the diagnostics program tests but did receive a POST error message, use “POST Error Messages List” to diagnose system problems. If you did not receive any error message, look for a description of your error symptoms in “Error Symptoms List” on page 120.

NOTE: When you have deemed it necessary to replace an FRU, and have done so, you must run a total system check to ensure that no other activity has been affected by the change. This system check can be done through the diagnostics program.

NOTE: Check all power supply voltages, switch, and jumper settings before you replace the main board. Also check the power supply voltages if you have a “system no-power” condition.

If you are unable to correct the problem by using the “BIOS Messages List” table and “Error Symptoms List” table, go to “Undetermined Problems”.

To diagnose a problem, first find the BIOS error messages in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/FRU listed in right column is the most likely cause.

BIOS Messages	Action/FRU
BIOS ROM checksum error - System halted	The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt. Contact your system dealer to replace the BIOS.
CMOS Battery Failed	The CMOS battery is no longer functional. Contact your system dealer for a replacement the BIOS.
CMOS Checksum Error- defaults loaded	Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. A weak battery may have caused this error. Check the battery and replace if necessary.
CPU at nnnn	Displays the running speed of CPU.
Display switch is set incorrectly	The display switch on the motherboard can be set to either monochrome or color. This message indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the Video selection.
Press ESC to skip memory test	The user may press Esc to skip the full memory test.
Floppy disk(s) fail	Cannot find or initialize the floppy drive controller or the drive. Make sure the controller is installed correctly, if no floppy drives are installed, be sure the Diskette Drive selection in Setup is set to NONE or AUTO.
HARD DISK initializing - Please wait a moment	Some hard drives require extra time to initialize.
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard drive controller or the drive. Make sure the controller is installed correctly. If no hard drives are installed, be sure the Hard Drive Selection in Setup is set to NONE.
Hard disk(s) diagnosis fail	The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.

BIOS Messages	Action/FRU
Keyboard Error Or No Keyboard Present	Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are pressed during POST. To purposely configure the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.
Keyboard is locked out - Unlock the key	This message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.
Memory Test:	This message displays during a full memory test, counting down the memory areas being tested.
Memory test fail	If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.
Override enabled - Defaults loaded	If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration with a set of BIOS defaults designed for the most stable, minimal-performance system operations.
Press TAB to show POST screen	System OEMs may replace the Phoenix Technologies Award BIOS POST display with their own proprietary display. Including this message in the OEM display permits the operator to switch between the OEM display and the default POST display.
Primary master hard disk fail	POST detects an error in the primary master IDE hard drive.
Primary slave hard disk fail	POST detects an error in the secondary master IDE hard drive.
Secondary master hard disk fail	POST detects an error in the primary slave IDE hard drive.
Secondary slave hard disk fail	POST detects an error in the secondary slave IDE hard drive.

Error Symptoms List

NOTE: To diagnose a problem, first find the error symptom in the left column. If directed to a check procedure, replace the FRU indicated in the check procedure. If no check procedure is indicated, the first Action/ FRU listed in right column is the most likely cause.

Error Symptom	Action/FRU
Processor / Processor Fan	
NOTE: Normally, the processor fan should be operative, and the processor clock setting should be exactly set to match its speed requirement before diagnosing any processor problems.	
Processor fan does not run but power supply fan runs.	1. Ensure the system is not in power saving mode. See “Power Management” in chapter 2. 2. With the system power on, measure the voltage of processor fan connector. Its reading should be +12Vdc. Its reading should be +12Vdc. If the reading shows normal, but the fan still does not work, then replace a good fan. 3. Main board.
Processor test failed.	1. Processor. 2. Main board.
Main board and Memory	
NOTE: Ensure the memory modules are installed properly and the contact leads are clean before diagnosing any system problems.	
Memory test failed.	1. See "Memory" 2. Main board
Incorrect memory size shown or repeated during POST.	1. Insert the memory modules in the DIMM sockets properly, then reboot the system. 2. Memory module. 3. Main board.
System works but fails to enter power saving mode when the `Power Management Mode` is set to `Enabled`.	1. Enter BIOS Setup and load default settings. In Windows Systems, check settings in Power Management Property of Control Panel. 2. Reload software from Recovery CD.
Blinking cursor only; system does not work.	1. Diskette/IDE drive connection/cables 2. Diskette/IDE disk drives 3. See “Undetermined Problems”. 4. Main board
Diskette Drive	
NOTE: Ensure the diskette drive is auto-setting in BIOS Setup and its read/write head is clean before diagnosing any diskette drive problems.(If only one drive is installed, please make sure the drive is connected to master connector or the drive is set to master.)	
Media and drive are mismatched.	1. Ensure the diskette drive is configured correctly in the Disk Drives of BIOS Setup. 2. Ensure the diskette drive is correctly formatted. 3. Diskette drive connection/cable 4. Diskette drive 5. Main board
Diskette drive does not work.	1. Ensure the diskette drive is not set to `None` in the Disk Drives of BIOS Setup. 2. Diskette drive power 3. Diskette drive connection/cable 4. Diskette drive 5. Main board

Error Symptom	Action/FRU
Diskette drive read/write error.	1. Diskette. 2. Diskette drive cable. 3. Diskette drive. 4. Main board.
Diskette drive LED comes on for more than 2 minutes when reading data.	1. Diskette 2. Diskette drive connection/cable 3. Diskette drive 4. Main board
Diskette drive LED fails to light, and the drive is unable to access for more than 2 minutes.	1. Diskette 2. Diskette drive power 3. Diskette drive connection/cable 4. Diskette drive 5. Main board
Diskette drive test failed.	1. Diskette 2. Diskette drive 3. Diskette drive cable 4. Main board
Hard Disk Drive	
NOTE: Ensure hard disk drive is configured correctly in BIOS Setup, cable/jumper are set correctly before diagnosing any hard disk drive problems. (If only one drive is installed, please make sure the drive is connected to master connector or the drive is set to master.)	
Hard disk drive test failed.	1. Enter BIOS Setup and Load default settings. 2. Hard disk drive cable. 3. Hard disk drive. 4. Main board.
Hard disk drive cannot format completely.	1. Enter BIOS Setup and Load default settings. 2. Hard disk drive cable. 3. Hard disk drive. 4. Main board.
Hard disk drive has write error.	1. Enter BIOS Setup and Load default settings. 2. Hard disk drive.
Hard disk drive LED fails to light, but system operates normally.	1. With the system power on, measure the voltage of hard disk LED connector. 2. Hard drive LED cable.
CD/DVD-ROM Drive	
NOTE: Ensure CD/DVD-ROM drive is configured correctly in BIOS Setup, cable/jumper are set correctly and its laser beam is clean before diagnosing any CD/DVD-ROM drive problems.	
CD/DVD-ROM drive LED doesn't come on but works normally.	1. CD/DVD-ROM drive
CD/DVD-ROM drive LED flashes for more than 30 seconds before LED shutting off. Software asks to reinstall disc. Software displays a reading CD/DVD error.	1. CD/DVD-ROM may have dirt or foreign material on it. Check with a known good disc. 2. CD/DVD-ROM is not inserted properly. 3. CD/DVD-ROM is damaged.
CD/DVD-ROM drive cannot load or eject when the system is turned on and its eject button is pressed and held.	1. Disconnect all cables from CD/DVD-ROM drive except power cable, then press eject button to try to unload the disk. 2. CD/DVD-ROM drive power. 3. CD/DVD-ROM drive

Error Symptom	Action/FRU
CD/DVD-ROM drive does not read and there are no messages are displayed.	1. CD may have dirt or foreign material on it. Check with a known good disc. 2. Ensure the CD/DVD-ROM driver is installed properly. 3. CD/DVD-ROM drive.
CD/DVD-ROM drive can play audio CD but no sound output.	1. Ensure the headphone jack of the CD/DVD-ROM has an output. 2. Turn up the sound volume. 3. Speaker power/connection/cable. 4. CD/DVD-ROM drive.
Real-Time Clock	
Real-time clock is inaccurate.	1. Ensure the information in the `Standard CMOS Feature` of BIOS Setup is set correctly. 2. RTC battery. 3. Main board
Audio	
Audio software program invokes but no sound comes from speakers.	1. Speaker power/connection/cable.
Modem	
Modem ring cannot wake up system from suspend mode.	1. For the External Modem, make sure Power on By Ring in BIOS Setup or Power Management is set to Enabled. For the PCI modem, make sure Wake up by PCI card is set to Enabled. 2. If PCI modem card is used, reinsert the modem card to PCI slot firmly or replace the modem card. 3. In Win 98, ensure the telephone application is configured correctly for your modem and set to receive messages and/or fax.
Data/fax modem software program invokes but cannot receive/send data/ fax	1. Ensure the modem card is installed properly.
Fax/voice modem software program invokes but has no sound output. (Data files are received normally; voice from modem cannot be produced, but system sound feature works normally.)	1. Ensure the modem voice-in cable from modem adapter card to main board
Video and Monitor	
Video memory test failed. Video adapter failed.	1. Remove all non-factory-installed cards. 2. Load default settings (if screen is readable). 3. Main board
Display problem: - Incorrect colors No high intensity Missing, broken, or incorrect characters Blank monitor (dark) Blank monitor (bright) Distorted image Unreadable monitor Other monitor problems	1. Monitor signal connection/cable. 2. Monitor 3. Video adapter card 4. Main board
Display changing colors.	1. Monitor signal connection/cable 2. Monitor 3. Main board

Error Symptom	Action/FRU
Display problem not listed above (including blank or illegible monitor).	1. “Monitor" 2. Load default settings (if screen is readable). 3. Main board

Error Symptom	Action/FRU
Parallel/Serial Ports	
Execute “Load BIOS Default Settings” in BIOS Setup to confirm ports presence before diagnosing any parallel/serial ports problems.	
Serial or parallel port loop-back test failed.	1. Make sure that the LPT# or COM# you test is the same as the setting in BIOS Setup. 2. Loop-back. 3. Main board.
Printing failed.	1. Ensure the printer driver is properly installed. Refer to the printer service manual. 2. Printer. 3. Printer cable. 4. Main board.
Printer problems.	1. Refer to the service manual for the printer.
Keyboard	
Some or all keys on keyboard do not work.	1. Keyboard
Power Supply	
Pressing power switch does not turn off system. (Only unplugging the power cord from electrical outlet can turn off the system.)	1. Ensure the `Soft-off by PWR-BTTN.` in BIOS Setup of `Power Management` is not set to Instant-off. 2. Power switch cable assembly
Pressing power switch does not turn on the system.	1. Ensure the power override switch (situated at the back of the machine, just above the connector for the power cable) is not set to OFF. 2. Power switch cable assembly.
Executing software shutdown from Windows98 Start menu does not turn off the system. (Only pressing power switch can turn off the system).	1. Load default settings. 2. Reload software from Recovery CD.
No system power, or power supply fan is not running.	1. Power Supply 2. Main board
Other Problems	
Any other problems.	1. Undetermined Problems

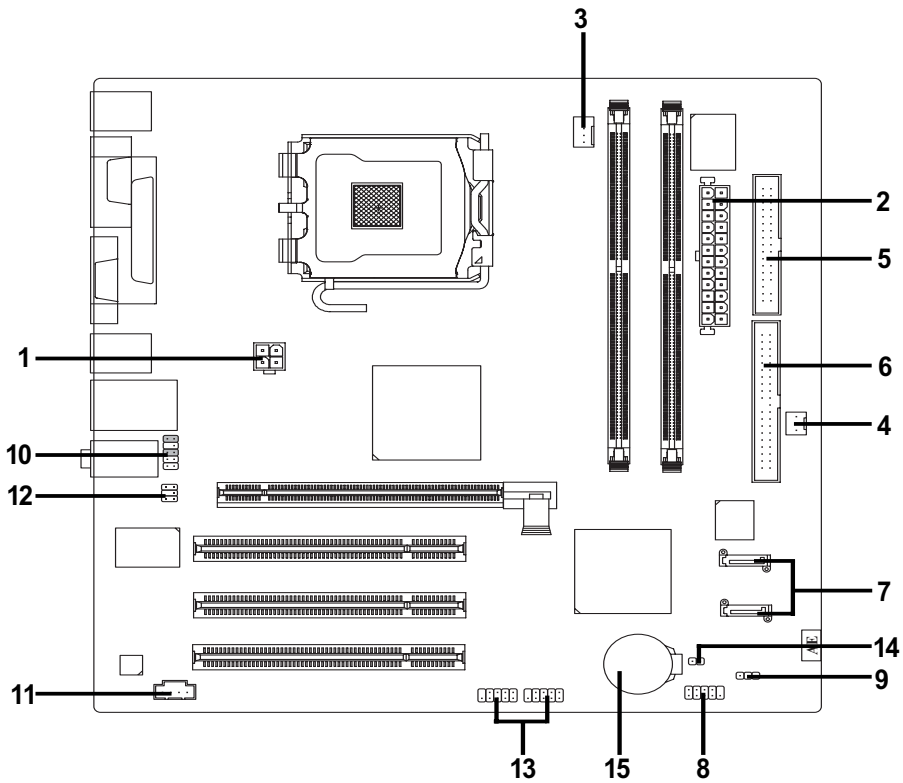
Undetermined Problems

If an error message is present, go to “POST Error Messages List” on page 118. If you did not receive any messages, if the symptom is listed in “or “Error Symptoms List” on page 120. If you still cannot solve the problem, continue with this check:

1. Check the power supply voltages. If the voltages are correct continue with the following steps:
2. Power off the system unit.
3. Perform the following checks, one by one, until you have isolated the problem FRU.
4. Load default settings in setup.
5. Check all main board jumper positions and switch settings.
6. Check all adapter card jumper positions.
7. Check all device jumper positions.
8. Check all cables and connectors for proper installation.
9. If the jumpers, switches and voltage settings are correct, remove or disconnect the following, one at a time:
10. Non-Acer devices
    - ❑ External devices
    - ❑ Any adapter card (modem card, LAN card or video card, if installed)
    - ❑ CD/DVD-ROM drive
    - ❑ Diskette drive
    - ❑ Hard disk drive
    - ❑ DIMM
    - ❑ Processor
    - ❑ Main board
11. Power on the system unit.
12. Repeat steps 2 through 5 until you find the failing device or adapter.

Jumper and Connector Information

Connectors Introduction



Item	Description	Item	Description
1	ATX_12V	9	PWR_LED
2	ATX (Power Connector)	10	F_AUDIO
3	CPU_FAN	11	CD_IN
4	SYS_FAN	12	SUR_CEN
5	FDD	13	F_USB1 / F_USB2
6	IDE	14	CLR_CMOS
7	SATA0 / SATA 1	15	BAT
8	F_PANEL		

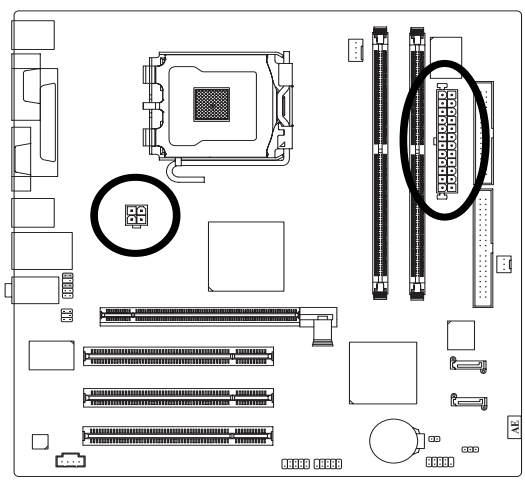
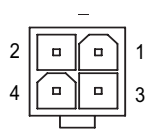
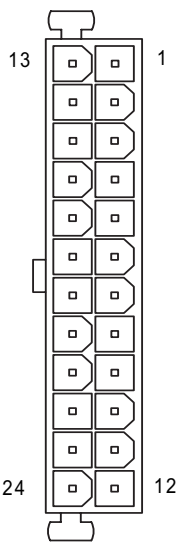
ATX_12V/ATX (Power Connector)

With the use of the power connector, the power supply can supply enough stable power to all the components on the mainboard. Before connecting the power connector, please make sure that all components and devices are properly installed. Align the power connector with its proper location on the mainboard and connect tightly. The ATX_12V power connector mainly supplies power to the CPU. If the ATX_12V power connector is not connected, the system will not start.

CAUTION:

Please use a power supply that is able to handle the system voltage requirements. It is recommemded that a power supply that can withstand high power consumption be used (300W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable system or a system that is unable to start.

If you use a 24-pin ATX power supply, please remove the small cover on the power connector on the motherboard before plugging in the power cord ; Otherwise, please do not remove it.

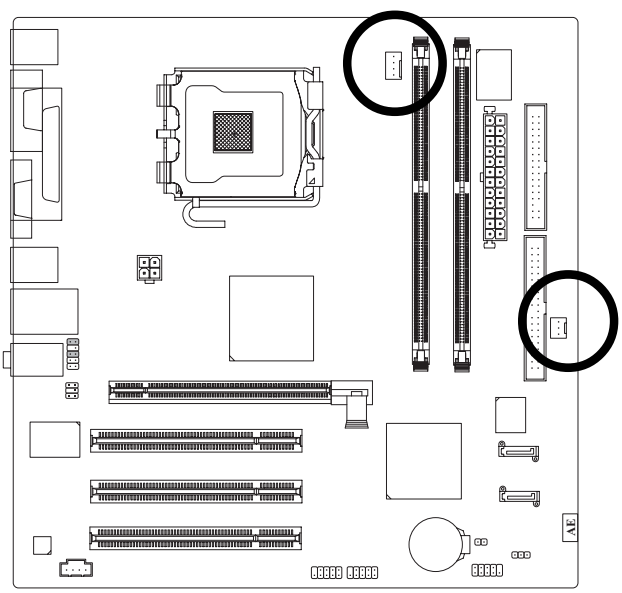
Illustrator	PIN No.	Definition
  	1	GND
	2	GND
	3	+12V
	4	+12V
	1	3.3V
	2	3.3V
	3	GND
	4	+5V
	5	GND
	6	+5V
	7	GND
	8	Power Good
	9	5V SB(stand by +5V)
	10	+12V
	11	+12V
	12	3.3V (Only for 24pins ATX)
	13	3.3V
	14	-12V
	15	GND
	16	PS_ON(soft On/Off)
	17	GND
	18	GND
	19	GND
	20	-5V
	21	+5V
	22	+5V
	23	+5V
	24	GND

CPU FAN / SYS FAN (Cooler Fan Power Connector)

The cooler fan power connector supplies a +12V power voltage via a 3-pin/4-pin (only for CPU FAN) power connector and possesses a foolproof connection design.

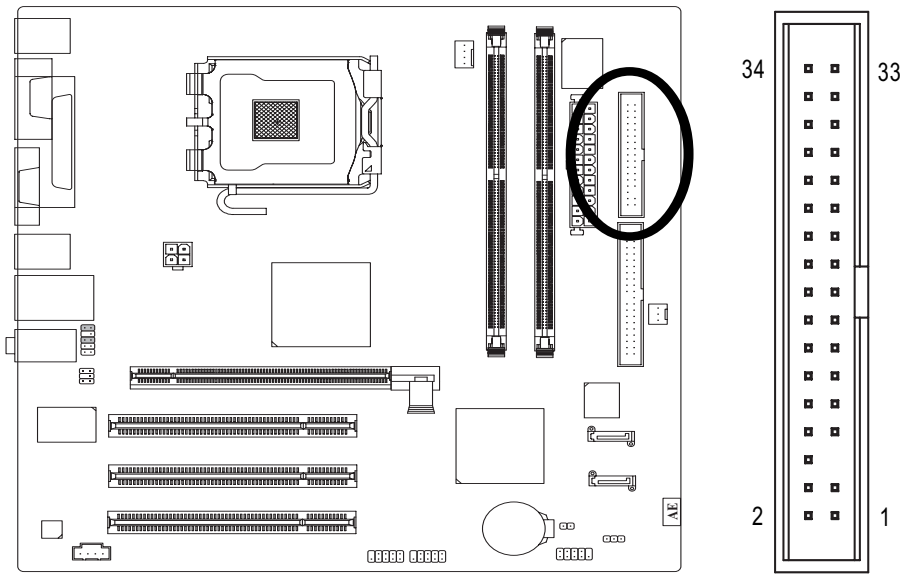
Most coolers are designed with color-coded power connector wires. A red power connector wire indicates a positive connection and requires a +12V power voltage. The black connector wire is the ground wire (GND). Please remember to connect the power to the cooler to prevent system overheating and failure.

CAUTION: Please remember to connect the power to the CPU fan to prevent CPU overheating and failure.

Illustrator	PIN No.	Definition
	1	GND
	2	+12V
	3	Sense
	4	Speed Control (Only for CPU_FAN)

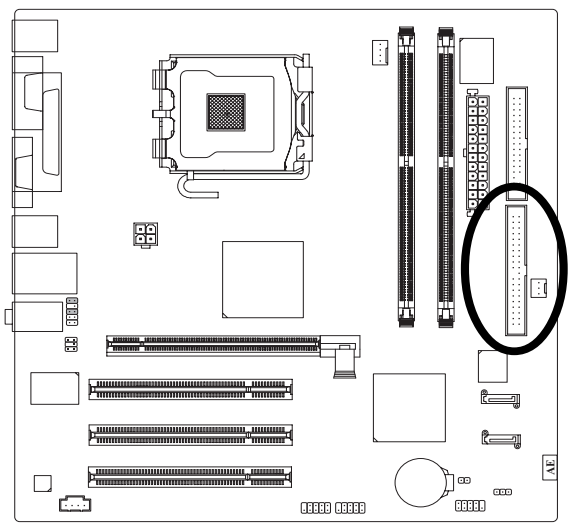
FDD (Floppy Connector)

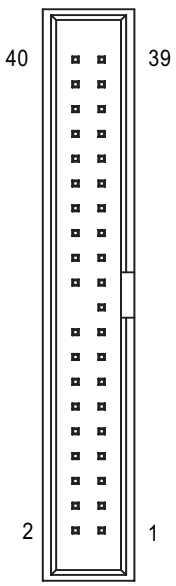
The FDD connector is used to connect the FDD cable while the other end of the cable connects to the FDD drive. The types of FDD drives supported are: 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB. Please connect the red power connector wire to the pin1 position.



IDE (IDE Connector)

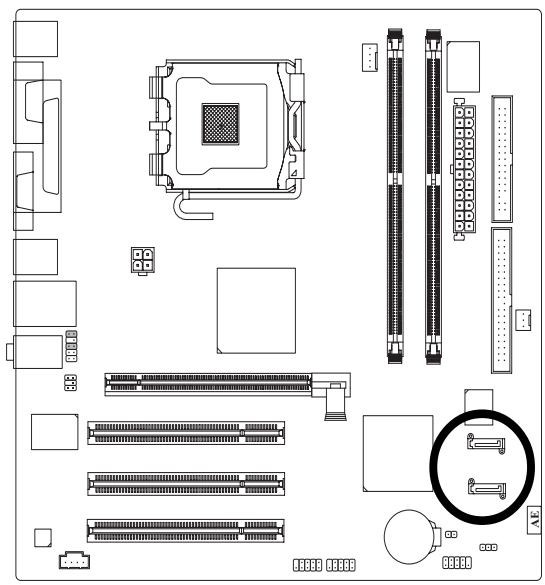
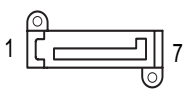
An IDE device connects to the computer via an IDE connector. One IDE connector can connect to one IDE cable, and the single IDE cable can then connect to two IDE devices (hard drive or optical drive). If you wish to connect two IDE devices, please set the jumper on one IDE device as Master and the other as Slave (for information on settings, please refer to the instructions located on the IDE device).





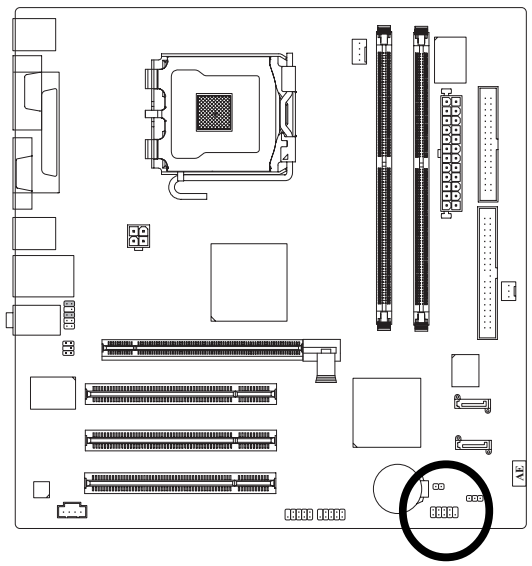
SATA0 / SATA1 (Serial ATA Connector, Controlled by ICH6)

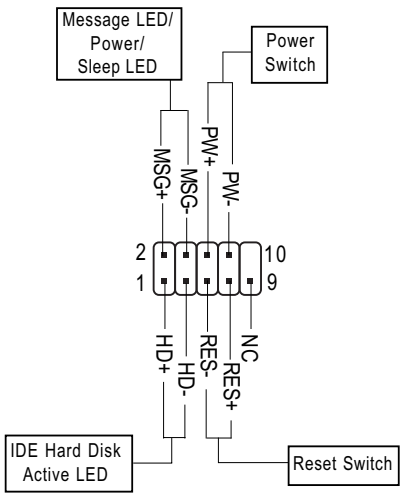
Serial ATA can provide 150MB/s transfer rate. Please refer to the BIOS setting for the Serial ATA and install the proper driver in order to work properly.

Illustrator	PIN No.	Definition
 	1	GND
	2	TXP
	3	TXN
	4	GND
	5	RXN
	6	RXP
	7	GND

F_PANEL (Front Panel Jumper)

Please connect the power LED, PC speaker, reset switch and power switch etc. of your chassis front panel to the F_PANEL connector according to the pin assignment below.

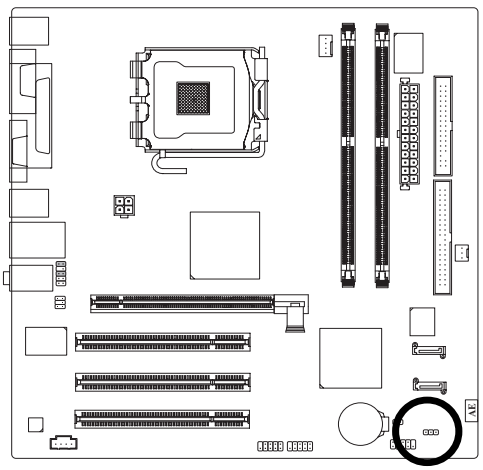




Item	Definition
HD (IDE Hard Disk Active LED)	Pin 1: LED anode(+) Pin 2: LED cathode(-)
RES (Reset Switch)	Open: Normal Operation Close: Reset Hardware System
PW (Power Switch)	Open: Normal Operation Close: Power On/Off
MSG (Message LED/Power/Sleep LED)	Pin 1: LED anode(+) Pin 2: LED cathode(-)
NC	NC

PWR_LED

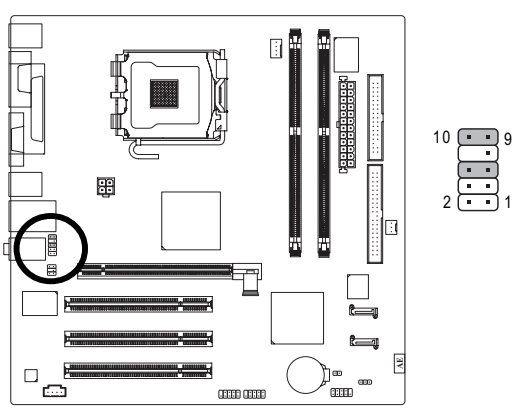
PWR_LED is connect with the system power indicator to indicate whether the system is on/off. It will blink when the system enters suspend mode.



Pin No.	Definition
1	MPD+
2	MPD-
3	MPD-

F_AUDIO (Front Audio Panel Connector)

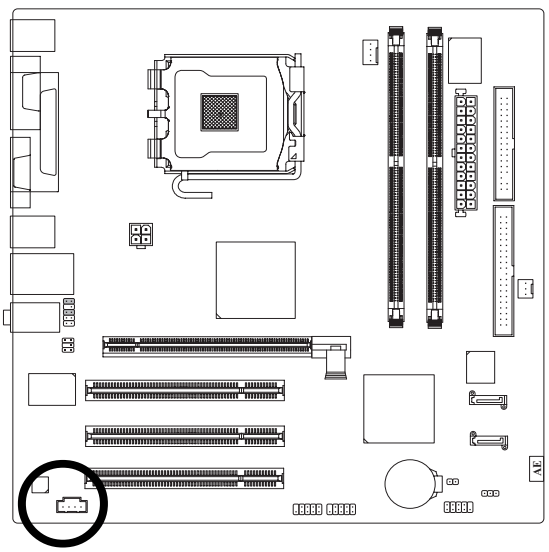
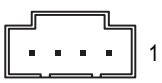
Please make sure the pin assigment on the cable is the same as the pin assigment on the mainboard header.



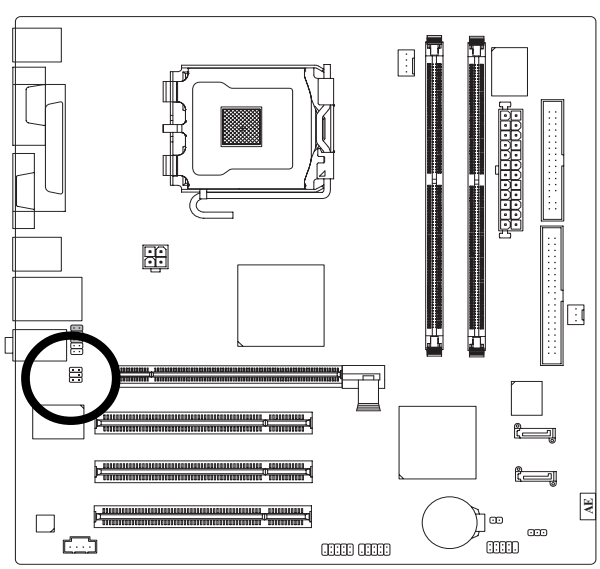
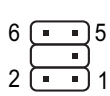
Pin No.	Definition
1	MIC
2	GND
3	MIC_BIAS
4	Power
5	Front Audio (R)
6	Rear Audio (R)/ Return R
7	NC
8	No Pin
9	Front Audio (L)
10	Rear Audio (L)/ Return L

CD_IN (CD IN)

Connect CD-ROM or DVD-ROM audio out to the connector.

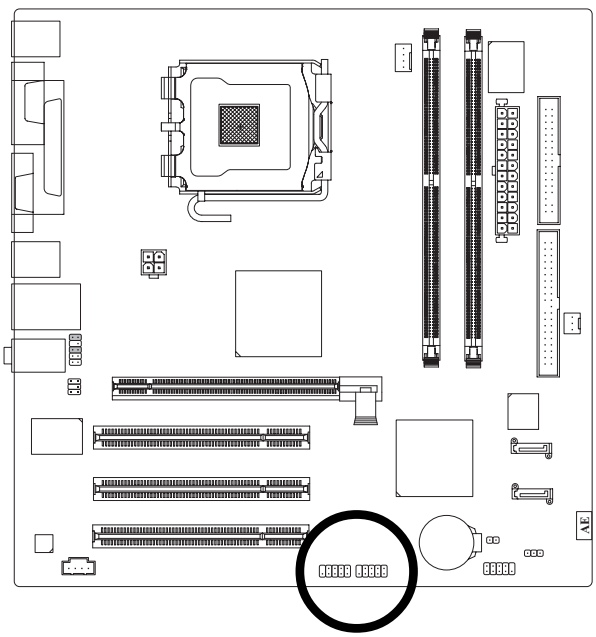
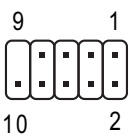
Illustrator	PIN No.	Definition
 	1	CD-L
	2	GND
	3	GND
	4	CD -R

SUR_CEN

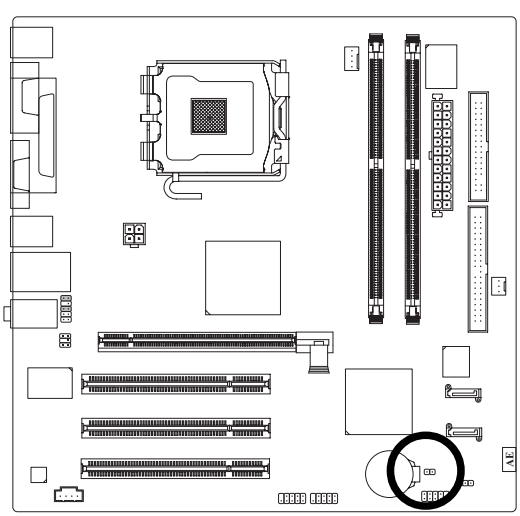
Illustrator	PIN No.	Definition
 	1	SUR OUTL
	2	SUR OUTR
	3	GND
	4	No Pin
	5	CENTER_OUT
	6	BASS_OUT

F_ USB1 / F_USB2 (Front USB Connector)

Be careful with the polarity of the front USB connector. Check the pin assignment carefully while you connect the front USB cable, incorrect connection between the cable and connector will make the device unable to work or even damage it.

Illustrator	PIN No.	Definition
 	1	Power
	2	Power
	3	USB DX-
	4	USB Dy-
	5	USB DX+
	6	USB Dy+
	7	GND
	8	GND
	9	No Pin
	10	NC

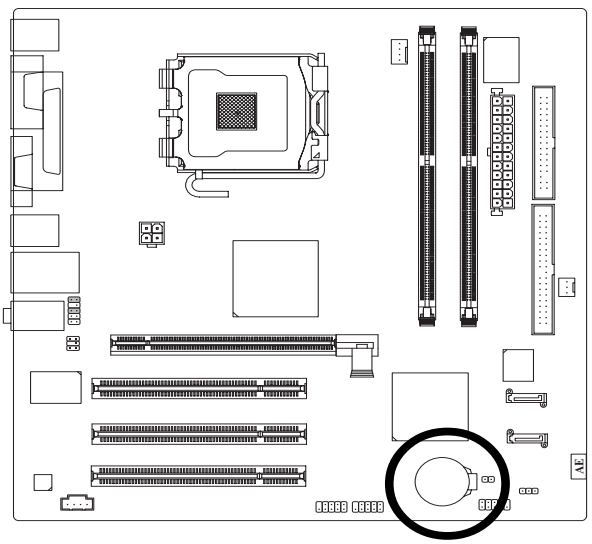
CLR_CMOS (Clear CMOS)



Open: Normal

Short :Clear CMOS

BAT(Battery)



CAUTION:

1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.

Clear CMOS

1. Turn OFF the computer and unplug the power cord.
2. Take out the battery gently and put it aside for about 10 minutes (Or you can use a metal object to connect the positive and negative pins in the battery holder to make them short for one minute).
3. Re-install the battery.
4. Plug the power cord and turn ON the computer.

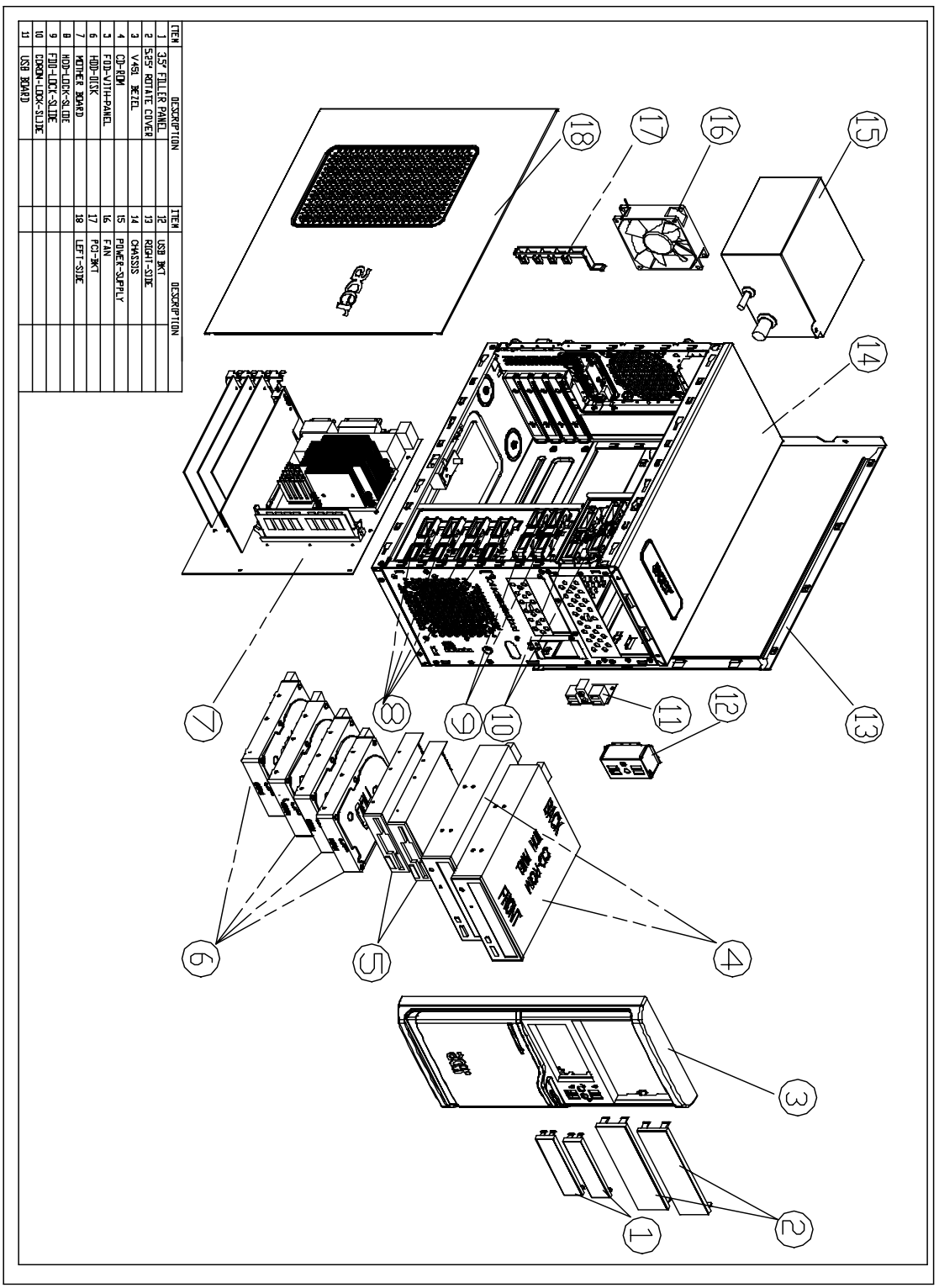
FRU (Field Replaceable Unit) List

This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of Aspire T670 and AcerPower FE. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

IMPORTANT: Please note WHEN ORDERING FRU PARTS, that you should check the most up-to-date information available on your regional web or channel. For whatever reasons a part number change is made, it will not be noted in the printed Service Guide. For ACER-AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code to those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how best to dispose it, or follow the rules set by your regional Acer office on how to return it.You can access to the website for the latest Parts version http://aicsl.acer.com.tw/spl/

Exploded Diagram



Model Definition and Configuration

The Aspire T670 / AcerPower FE Model No. Define:

1. Trade Mark:

2. Brand Name: Acer
3. Description: Intel 915GL + ICH6, P4 (90nm only) LGA775, DDR 333/400, PCIEx1
4. Model No: K6.1
5. Product Name: Aspire T670/AcerPower FE

Test Compatible Components

This computer's compatibility is a test plan released by Acer Internal Testing Department. Once the final report is available, this chapter will be revised accordingly.

Microsoft Windows XP Home Environment Test

Item	Vendor	Specifications
MB/IO Shielding/MB Kit	Giga-Byte	Intel 915GL + ICH6, P4 (90nm only) LGA775, DDR 333/400, PCIEx1 Intel 915GL + ICH6, P4 (90nm only) LGA775, DDR 333/400, PCIEx1 + IO Shielding IO shielding
CPU	Intel	P4 670 (3.8G 2M 800FSB),670
		P4 660 (3.6G 2M 800FSB),660
		P4 640 (3.2G 2M 800FSB),640
		P4 630 (3.0G 2M 800FSB),630
		P4 571(3.8G 1M 800FSB, EM64T) (E-0),571
		P4 561(3.6G 1M 800FSB, EM64T) (E-0),561
		P4 551(3.4G 1M 800FSB, EM64T) (E-0),551
		P4 541(3.2G 1M 800FSB, EM64T) (E-0),541
		P4 531(3.0G 1M 800FSB, EM64T) (E-0),531
		P4 521(2.8G 1M 800FSB, EM64T) (E-0),521
		P4 570 (3.8G 1M 800FSB) (E-0),570J
		P4 560 (3.6G 1M 800FSB) (E-0),560J
		P4 550 (3.4G 1M 800FSB) (E-0),550J
		P4 520 (2.8G 1M 800FSB) (E-0),520J
		P4 515 (2.93G 1M 533FSB) (E-0),515J
		P4 505 (2.66G 1M 533FSB) (E-0),505J
	Celeron	Celeron D 351(3.2G 256K 533FSB LGA775, EM64T),CD351
		Celeron D 346(3.06G 256K 533FSB LGA775, EM64T),CD346
		Celeron D 341(2.93G 256K 533FSB LGA775, EM64T),CD341
		Celeron D 336(2.8G 256K 533FSB LGA775, EM64T),CD336
		Celeron D 331(2.66G 256K 533FSB LGA775, EM64T),CD331
		Celeron D 326(2.53G 256K 533FSB LGA775, EM64T),CD326
		Celeron D 350 (3.2G 256K 533FSB), E-0,Celeron D 350
		Celeron D 345 (3.06G 256K 533FSB), E-0,Celeron D 345
		Celeron D 340 (2.93G 256K 533FSB), E-0,Celeron D 340
		Celeron D 335 (2.8G 256K 533FSB), E-1,Celeron D 335
		Celeron D 330 (2.66G 256K 533FSB), E-1,Celeron D 330
		Celeron D 325 (2.53G 256K 533FSB), E-2,Celeron D 325
Retention Module	Foxconn	RM For Socket T,For 775 CPU Cooler
Cooler	Foxconn	Foxconn cpu cooler PKP249GB1U12 + PMD1208PKV1-A revision 3,PKP249GB1U12 + PMD1208PKV1-A rev3
		Foxconn cpu cooler PKP249GB1U12 + PMD1208PKV1-A revision 5,PKP249GB1U12 + PMD1208PKV2-A rev5
System Fan	Sunon	Sunon 92X92X25mm 2200RPM System Fan ,KDE1209PTV3

Item	Vendor	Specifications
Memory-DDR400	Apacer	128MB DDR400 PSC Chip 16Mx16 256Mb DDR400 512Mb DDR400
	Nanya	DDR400 256MB 0.11u Nanya DDR400 512MB 0.11u
	Hynix	DDR400 256MBHYMD232646D8R-D43PQ DDR400 512MB HYMD264646D8R-D43PQ
	Infineon	DDR400 256MB (.11u/Green) DDR400 512MB 0.11u (Green) 32M*8*16 DDR400 1024MB 0.11u, 128M*64, CL=3
	PQI	256DDR400 512 DDR400
	Super Elixir	256DDR400 512 DDR400
Hard Disk	WD	80G WD 3.5" 7200rpm XL80SD II 120G WD 3.5" 7200rpm XL80 II 160G WD 3.5" 7200rpm XL80 II 200G WD 3.5" 7200rpm XL80 II 250G WD 3.5" 7200rpm XL80 II
	Seagate	80G 3.5" 7200rpm Alpine/Puma SATA 1.5G, 2MB 80G 3.5" 7200rpm Alpine/Puma SATA 1.5G, 8MB 120G 3.5 7200rpm Alpine/Puma SATA 1.5G, 2MB 120G 3.5 7200rpm Alpine/Puma SATA 1.5G, 8MB 160G 3.5 7200rpm Alpine/Puma SATA 1.5G, 2MB 160G 3.5 7200rpm Alpine/Puma SATA, 1.5G, 8MB 200G 3.5 7200rpm Alpine SATA 1.5G, 8MB 250G 3.5" 7200rpm Tonka 1 SATA 8MB (RohS) 300G 3.5" 7200rpm Tonka 1 SATA 8MB (RohS) 400G 3.5" 7200rpm Tonka 1 SATA 8MB (RohS)
	HGST	80GB HGST 3.5" 7200RPM SATA2, BA1356 160GB HGST 3.5" 7200RPM SATA2, BA1387 250GB HGST 3.5" 7200RPM SATA2, BA1387 400GB HGST 3.5" 7200RPM SATA2, BA1246
CD-ROM	Liteon	52X (Black), LF,LTN-529S (Black)
CD-RW	HLDS	GCE-8526B(black) GCE-8527Bk , LF
Combo	HLDS	GCC-4521B (Black) GCC-4522B, LF
	Ltieon	52X Combo (Black) 52X Combo (Black), LF
DVD-ROM	HLDS	16X/40X , GDR-8163B(black)
	Liteon	16X/40X (black), LF
	Pioneer	16X/40X (Black)
DVD Dual	Liteon	16X DVD Dual (Double layer) (black) 16X DVD Dual (Double layer) (black), LF
	HLDS	16X SuperMultiplus 16X DVD Dual (Double layer) (black), LF
	Pioneer	16X DVD Dual (Double layer) (black), LF

Item	Vendor	Specifications
VGA CARD	Sapphire	Sapphire X300SE 128MB TV-OUT VGA LP PAL w/ ATX breaket Sapphire X300SE 128MB VGA+TVO NTSC w/ATX Bracket SP X600Pro 9C45 256MB 128bit TVO+DVI+DSUB PAL w/ATX BKT SP X600Pro 9C45 256MB 128bit TVO+DVI+DSUB NTSC w/ATX BKT SP X600Pro 8C45 128MB 128bit TVO+DVI+DSUB PAL w/ATX BKT SP X600Pro 8C45 128MB 128bit TVO+DVI+DSUB NTSC w/ATX BKT
	Leadtek	LTK LR2A22 GF6600 256MB 128bit TVO+DVI+DSUB PAL w/ATX BKT LTK LR2A22 GF6600 256MB 128bit TVO+DVI+DSUB NTSC w/ATX BKT
TV Tuner card	Leadtek	Tuner Card w/FM/ NTSC /ATX Bkt (Philip MK3 Tuner + 883 chip) Tuner Card w/FM/ PAL /ATX Bkt (Philip MK3 Tuner + 881 chip)
Modem Card	Liteon	Liteon 56K modem with ATX bkt D-1156l#/A1A
Housing	Foxconn	Microtower / 3.5"*2 + 5.25"*2 + internal 3.5*4
PSU	FSP	300W non-PFC 300W for PFC
	Liteon	300W for non-PFC 300W for PFC
FDD	Adomax	JU-256A198PC
Card Reader	KYE	3.5" 9-in-1 card reader
Wireless Reciever	Chicony	RF external receiver
	Logitech	USB RF receiver, Guppy, w/i case
Wireless KB	Chicony	Chicony wireless KB (silver), KBR0355, US ver., 104 keys Chicony Wireless KB (silver), KBR0355, T. Chinese ver., 104 keys
Wireless Mouse	Chicony	Chicony wireless mouse (silver), MSR0238T
e-Mode Kit	NFIC	External USB Receiver + USB cable for Receiver + Remote Controller
Wireless dongle	Acer	WLAN 11g USB Dongle IEEE 802.11g WLAN-G-US1

Item	Vendor	Specifications
Keyboard	Chicony	PS/2 Keyboard, KBP2971, US Ver., 104keys
		PS/2 Keyboard, KBP2971, T.Chinese Ver., 104keys
		PS/2 Keyboard, KBP2971, Arabic Ver., 104keys
		PS/2 Keyboard, KBP2971, Thai Ver., 104keys
		PS/2 Keyboard, KBP2971, Spanish/US Ver., 105keys
		PS/2 Keyboard, KBP2971, Int'l US Ver., 104keys
		PS/2 Keyboard, KBP2971, Canadian/French Ver., 105keys
		PS/2 Keyboard, KBP2971, Brazilian Ver., 107keys
		PS/2 Keyboard, KBP2971, UK Ver., 104keys
		PS/2 Keyboard, KBP2971, French Ver., 105keys
		PS/2 Keyboard, KBP2971, Germany Ver., 105keys
		PS/2 Keyboard, KBP2971, Italian Ver., 105keys
		PS/2 Keyboard, KBP2971, Swiss Ver., 105keys
		PS/2 Keyboard, KBP2971, Swedish Ver., 105keys
		PS/2 Keyboard, KBP2971, Belgium Ver., 105keys
		PS/2 Keyboard, KBP2971, Dutch Ver., 105keys
		PS/2 Keyboard, KBP2971, Holland Ver., 105keys
		PS/2 Keyboard, KBP2971, Spanish Ver., 105keys
		PS/2 Keyboard, KBP2971, Portugese Ver., 105keys
		PS/2 Keyboard, KBP2971, Iceland Ver., 105keys
		PS/2 Keyboard, KBP2971, Norwegian Ver., 105keys
		PS/2 Keyboard, KBP2971, Hebrew Ver., 105keys
		PS/2 Keyboard, KBP2971, Polish Ver., 105keys
		PS/2 Keyboard, KBP2971, Slovenian Ver., 105keys
		PS/2 Keyboard, KBP2971, Slovakian Ver., 105keys
		PS/2 Keyboard, KBP2971, Turkey Ver., 105keys
		PS/2 Keyboard, KBP2971, RussiamVer., 104keys
		PS/2 Keyboard, KBP2971, Hungaria Ver., 105keys
		PS/2 Keyboard, KBP2971, Greek Ver., 104keys
		PS/2 Keyboard, KBP2971, Denmark Ver., 105keys
		PS/2 Keyboard, KBP2971, Czech Ver., 104keys
		PS/2 Keyboard, KBP2971, US Ver., 104keys, Japan ABS
		PS/2 Keyboard, KBP2971, Arabic Ver., 104keys, Japan ABS
		PS/2 Keyboard, KBP2971, Int'l US Ver., 104keys, Japan ABS
		PS/2 Keyboard, KBP2971, UK Ver., 104keys, Japan ABS
		PS/2 Keyboard, KBP2971, French Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Germany Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Italian Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Swiss Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Swedish Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Belgium Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Dutch Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Holland Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Spanish Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Portugese Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Iceland Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Norwegian Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Hebrew Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Polish Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Slovenian Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Slovakian Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Turkey Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, RussiamVer., 104keys, Japan ABS

Item	Vendor	Specifications
		PS/2 Keyboard, KBP2971, Hungaria Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Hungaria Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Greek Ver., 104keys, Japan ABS
		PS/2 Keyboard, KBP2971, Denmark Ver., 105keys, Japan ABS
		PS/2 Keyboard, KBP2971, Czech Ver., 104keys, Japan ABS
		USB Keyboard, KU0355, US Ver., 104keys
		USB Keyboard, KU0355, T.Chinese Ver., 104keys
		USB Keyboard, KU0355, In'l US Ver., 104keys
		USB Keyboard, KU0355, Arabic Ver., 104keys
		USB Keyboard, KU0355, Thai Ver., 104keys
		USB Keyboard, KU0355, Germany Ver., 105keys
		USB Keyboard, KU0355, Italian Ver., 105keys
		USB Keyboard, KU0355, French Ver., 105keys
		USB Keyboard, KU0355, Sweden Ver., 105keys
		USB Keyboard, KU0355, UK Ver., 104keys
		USB Keyboard, KU0355, Spanish Ver., 105keys
		USB Keyboard, KU0355, Dutch Ver., 105keys
		USB Keyboard, KU0355, Portugese Ver., 105keys
		USB Keyboard, KU0355, Canadian/French Ver., 105keys
		USB Keyboard, KU0355, Brazilian Ver., 107keys
		USB Keyboard, KU0355, Swiss Ver., 105keys
		USB Keyboard, KU0355, Belgium Ver., 105keys
		USB Keyboard, KU0355, Holland Ver., 105keys
		USB Keyboard, KU0355, Iceland Ver., 105keys
		USB Keyboard, KU0355, Norwegian Ver., 105keys
		USB Keyboard, KU0355, Hebrew Ver., 105keys
		USB Keyboard, KU0355, Polish Ver., 105keys
		USB Keyboard, KU0355, Slovenian Ver., 105keys
		USB Keyboard, KU0355, Slovakian Ver., 105keys
		USB Keyboard, KU0355, Turkey Ver., 105keys
		USB Keyboard, KU0355, RussiamVer., 104keys
		USB Keyboard, KU0355, Hungaria Ver., 105keys
		USB Keyboard, KU0355, Greek Ver., 104keys
		USB Keyboard, KU0355, Denmark Ver., 104keys
		USB Keyboard, KU0355, Czech Ver., 104keys
		USB Keyboard, KU-0355, US Ver., 104keys, Japan ABS
		USB Keyboard, KU-0355, In'l US Ver., 104keys, Japan ABS
		USB Keyboard, KU-0355, Arabic Ver., 104keys, Japan ABS
		USB Keyboard, KU-0355, Germany Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Italian Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, French Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Sweden Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, UK Ver., 104keys, Japan ABS
		USB Keyboard, KU-0355, Spanish Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Dutch Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Portugese Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Swiss Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Belgium Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Holland Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Iceland Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Norwegian Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Hebrew Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Polish Ver., 105keys, Japan ABS
		USB Keyboard, KU-0355, Slovenian Ver., 105keys, Japan ABS

Item	Vendor	Specifications
		USB Keyboard, KU-0355, Slovakian Ver., 105keys, Japan ABS USB Keyboard, KU-0355, Turkey Ver., 105keys, Japan ABS USB Keyboard, KU-0355, RussiamVer., 104keys, Japan ABS USB Keyboard, KU-0355, Hungaria Ver., 105keys, Japan ABS USB Keyboard, KU-0355, Greek Ver., 104keys, Japan ABS USB Keyboard, KU-0355, Denmark Ver., 104keys, Japan ABS USB Keyboard, KU-0355, Czech Ver., 104keys, Japan ABS
Keyboard	Logitech	Wireless KB, Cocoon, US ver., 104 keys Wireless KB, Cocoon, TC ver., 104 keys , with STK label Wireless KB, Cocoon, Int'l US ver., 104 keys Wireless KB, Cocoon, Arabic ver., 104 keys Wireless KB, Cocoon, Thai ver., 104 keys Wireless KB, Cocoon, Germany ver., 105 keys Wireless KB, Cocoon, Italian ver., 105 keys Wireless KB, Cocoon, French ver., 105 keys Wireless KB, Cocoon, Sweden ver., 105 keys Wireless KB, Cocoon, Spanish ver., 105 keys Wireless KB, Cocoon, UK ver., 105 keys Wireless KB, Cocoon, Swiss ver., 105 keys Wireless KB, Cocoon, Belgium ver., 105 keys Wireless KB, Cocoon, Czech ver., 104 keys Wireless KB, Cocoon, Russian ver., 104 keys Wireless KB, Cocoon, Denmark ver., 105 keys Wireless KB, Cocoon, Dutch ver., 105 keys Wireless KB, Cocoon, Portugese ver., 105 keys Wireless KB, Cocoon, Slovak ver., 105 keys Wireless KB, Cocoon, Iceland ver., 105 keys Wireless KB, Cocoon, Norwegian ver., 105 keys Wireless KB, Cocoon, Hebrew ver., 105 keys Wireless KB, Cocoon, Polish ver., 105 keys Wireless KB, Cocoon, Slovenian ver., 105 keys Wireless KB, Cocoon, Turkey ver., 105 keys Wireless KB, Cocoon, Hungaria ver., 105 keys Wireless KB, Cocoon, Greek ver., 104 keys
Mouse	Logitech	USB Optical Mouse, 2 button+wheel (silver) Logitech PS/2 ball mouse USB optical mouse, MUV ACR1, Lead-free USB optical mouse, MUV ACR1, Lead-free, w/ STK label Wireless Mouse, RAF95 Logitech MUV-ACR1 USB optical mouse, with STK label Logitech M-SBJ96 PS/2 ball mouse black, with STK label
	KYE	PS/2 Mouse, 2 button+wheel (black) Lead-Free / Netscroll / PS2 mouse KYE NetScroll PS2 ball mouse black, with STK label
Speaker	Neosonica	USB, 3" *2 A2.1 speaker w/o CCC sticker, default setting is 220V A2.1 speaker w/o CCC sticker, default setting is 110V A2.1 speaker with CCC sticker, default setting is 220V
	Logitech	Logitech 2.0 speaker, S100, 110V with US plug type,Logitech logo 2.0 speaker, S100, 110V with US plug type, Acer logo 2.0 speaker, S100, 230V w/ Europe plug type, Acer logo 2.0 speaker, S100, 230V w/ACA plug type, Acer logo

Online Support Information

This section describes online technical support services available to help you repair your Acer Systems.

If you are a distributor, dealer, ASP or TPM, please refer your technical queries to your local Acer branch office. Acer Branch Offices and Regional Business Units may access our website. However some information sources will require a user i.d. and password. These can be obtained directly from Acer CSD Taiwan.

Acer's Website offers you convenient and valuable support resources whenever you need them.

In the Technical Information section you can download information on all of Acer's Notebook, Desktop and Server models including:

- Service guides
- User's manuals
- Training materials
- Main manuals
- Bios updates
- Software utilities
- Spare parts lists
- TABs (Technical Announcement Bulletin)

For these purposes, we have included an Acrobat File to facilitate the problem-free downloading of our technical material.

Also contained on this website are:

- Detailed information on Acer's International Traveller's Warranty (ITW)
- Returned material authorization procedures
- An overview of all the support services we offer, accompanied by a list of telephone, fax and email contacts for all your technical queries.

We are always looking for ways to optimize and improve our services, so if you have any suggestions or comments, please do not hesitate to communicate these to us.